



# What's New(er) with z/OS Network Performance Monitoring with OMEGAMON?

## OMEGAMON XE for Mainframe Networks v5.1.1

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# Increasing visibility with mainframe monitoring can improve availability across entire Enterprise

## Key Takeaways



- IBM has provided leadership and best practices with System z Service Management **Visibility, Control and Automation** capability for years
- **Enterprise-wide Monitoring and Management** provides much better availability and performance results than individual separate products
- IBM's System z **OMEGAMON family** addresses key requirements, including reducing risk and decreasing costs, with improved productivity

# OMEGAMON for Mainframe Networks is a key part of the Integrated Service Management Ecosystem



## Visibility

Problem Determination, Management and Resolution



## Automation

Application, network and system command and message automation



# NetView for z/OS and OMEGAMON for Mainframe Networks together create single view of enterprise networks

NetView for z/OS

Network Availability

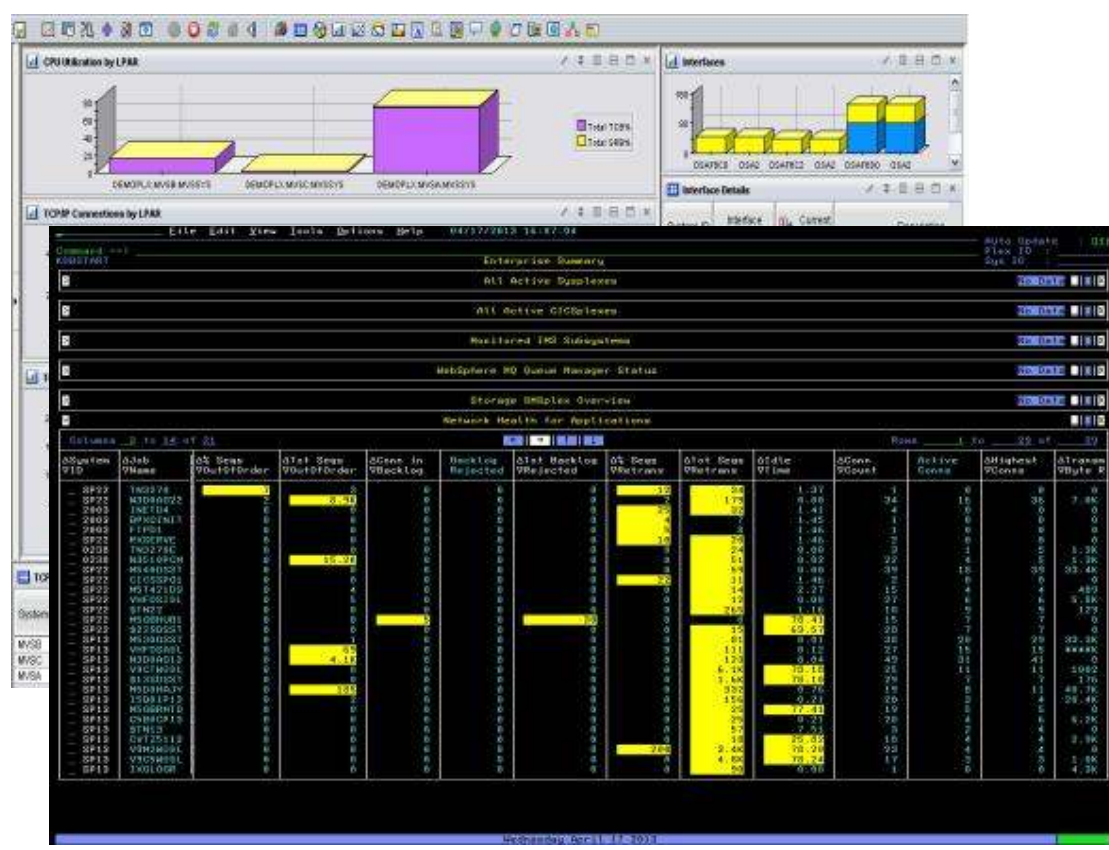
OMEGAMON XE for  
Mainframe Networks

Network Performance

- Common user interface integrates TCP/IP data from both NetView for z/OS and OMEGAMON XE for Mainframe Networks.
- Integration function provides customers with a consolidated TCP/IP workbench
  - Allowing management of both TCP/IP availability and performance from the same user interface.
- Smart IP tracing to immediately learn where poor or unstable TCP/IP connections hamper application performance



# OMEGAMON Version 5 ... Monitoring the z/OS sub-systems



- OMEGAMON XE z/OS V 5.1.1
- OMEGAMON XE CICS V 5.1
- OMEGAMON XE DB2 V5.1.1
- OMEGAMON XE IMS V5.1
- OMEGAMON XE Storage V5.1
- OMEGAMON XE Messaging V7.1
- OMEGAMON XE for  
Mainframe Networks V5.1.1**

OMEGAMON for z/OS Management Suite V5.1

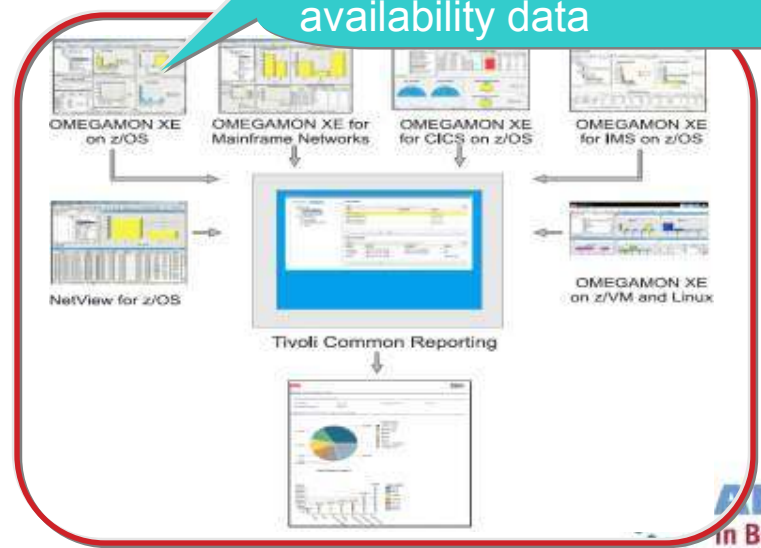
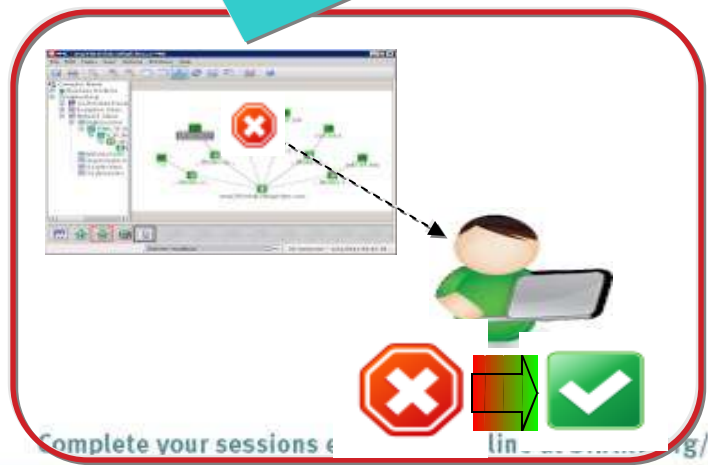
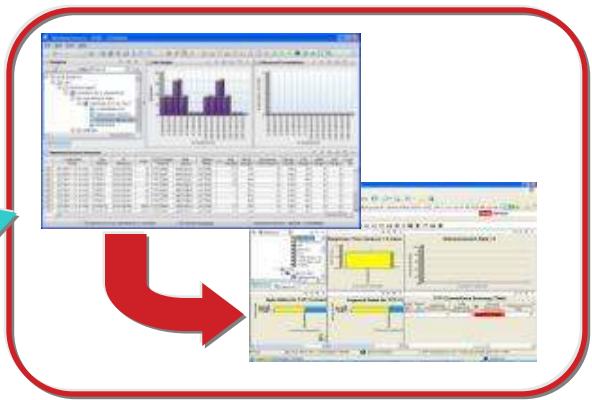
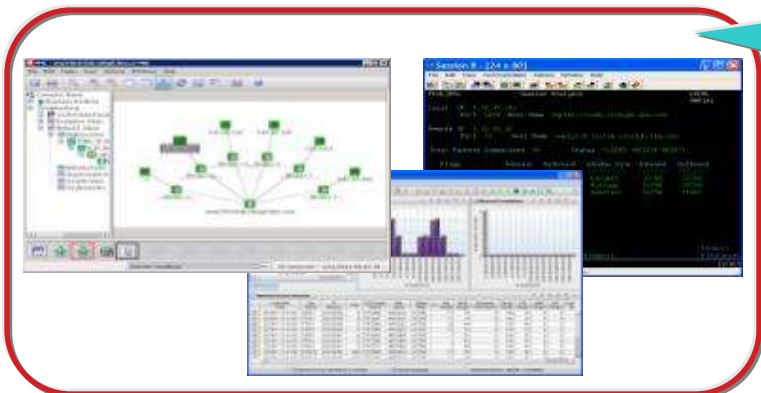
# All the components work together to keep applications and services available

Role appropriate views of right data at right time

Rapid problem diagnostics via common UI and drill down between products

Consistent historical views of resource performance and availability data

Alert me when thresholds breached and enable to automate corrective actions



## Business Agility with improved IT visibility now available with OMEGAMON V5 family

Modernized and strengthened OMEGAMON product line for reduced resource usage and faster problem resolution

Increased System Availability with faster problem resolution

- Enhanced 3270 User Interface for SMEs
- Built-in Problem Solving Scenarios

Improved Productivity with simplified information

- Faster Install/Configuration/Maintenance
- zEnterprise monitoring across z196/114 and zBX

Reduced Costs with decreased resource usage

- Usage of zIIP specialty servers
- Simplified OMEGAMON architecture



Individual products provide additional capability

# Enhanced 3270 user interface creates Enterprise wide view of information for improved availability



- Understand transactions across your enterprise
- Color coding to provide ability to find and resolve problems quickly
- Eliminates need to move between multiple screens and monitors

“GUI on a green screen”

File Edit View Tools Options Help 09/15/2012 08:43:52  
 Command ==> Auto Update : Off  
 KOBSTART Plex ID :  
 Enterprise Summary Sys ID :

**All Active Sysplexes**

ΔSysplex Name	ΔAverage VCPU Percent	Highest LPAR Name	ΔHighest VLPAR CPU%	ΔPercent LPAR VMSU Capacity	+LPAR Group Name
_ LPAR400J	7	CANSYSG	17	8.1	N/A

**All Active CICSplexes**

ΔCICSplex VName	ΔNumber of VRegions	ΔTransaction VRate	ΔCPU VUtilization	Any SOS Regions	SOS Region
_ OMEGPLEX	2	0/m	0.0%	No	

**All Active DB2 Subsystems**

ΔDB2 ID	Waiting On Tape Mount	DDF Inactive	Global Trace Active	DDF Receive Rate	DDF Send Rate
_ D91J	False	False	False	0	0
_ DB1D	False	False	False	0	0

**Monitored IMS Subsystems**

ΔIMS VID	ΔIMSplex VName	ΔMVS VID	ΔSysplex VName	Monitor Status	ΔDS VGroup	ΔSQ VGroup
_ IC1C	IC1C	SYS	LPAR400J	Online	IRLMCC	DFSICCG

At a glance, view key information for each OMEGAMON product

Navigate quickly through the data to identify the source of a problem

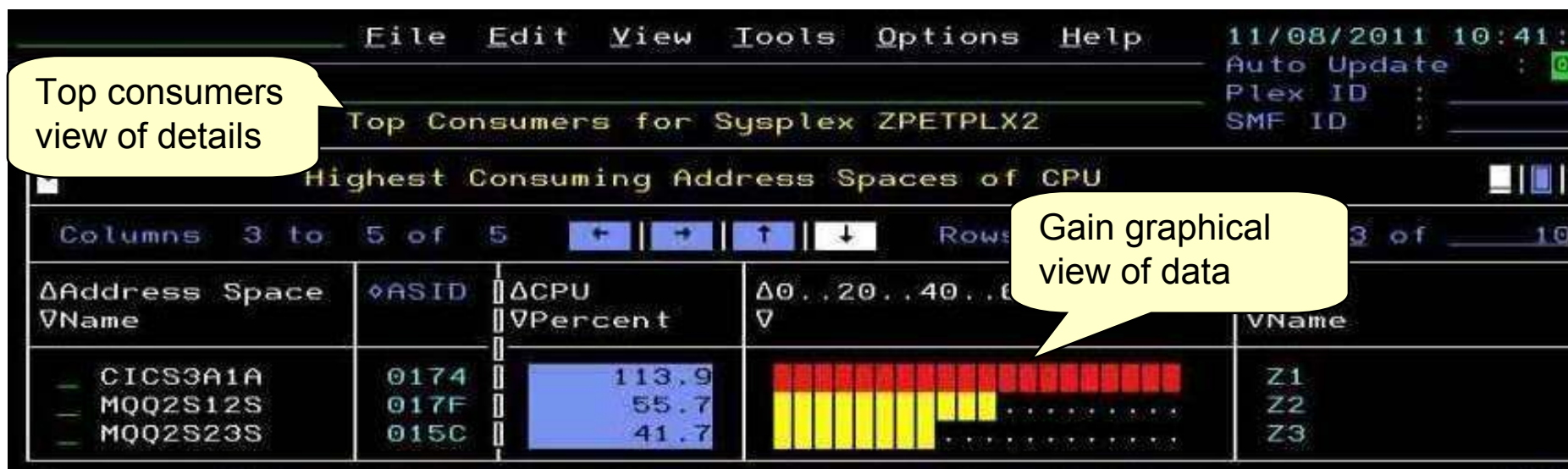




# Customer prioritized problem solving scenarios built into enhanced 3270 user interface

Easy to see and find critical system and sub-system information for improved performance and availability across System z

- Customized screens focused on customer defined problems
- Screen content based on high priority problems
- Includes Healthcheck and Bottleneck analysis



## OMEGAMON V5.1 enhanced configuration and maintenance capability with Self-Describing Agents

Faster, easier, less error-prone for improved reliability and productivity

- Eliminate monitoring outages caused by ITM Server recycles
  - Product upgrades/maintenance requires agent or RTEMS recycles only
- Eliminate maintenance upgrade errors:
  - Applies to new installs, staged upgrades, and maintenance
  - Crosschecks/validates version with installed data and framework
  - Avoids inconsistent application data in ITM framework layers
- Self-describing framework extensible to new capabilities
- Eliminates application data DVDs and CDs:
  - No extra distributed installs or upgrades for mainframe-centric customers



- Moving from 40 hours a week to 4 hours a week maintenance
- 80% improvement in time for installation and maintenance
- 30% improvement in time to configure post installation

# Customer-driven improvements simplify installation and configuration using PARMGEN

Replaces ICAT as primary way to install and configure

*Before: 145 ICAT **product-centric** jobs to configure 38 components for 1 LPAR RTE  
Today: 8 Parmgen **function-centric** jobs to configure components for 1 LPAR RTE  
Customers experiencing over 35% improvement in install and configuration time*

- Easy to walkthrough steps to complete configuration and customize profile
- Automatically updates hundreds of configuration artifacts, including auto-discovery of system values
- Validate parameter settings for tolerance and type
- Imports settings from an existing ICAT environment
- Re-run to change values, add or delete products

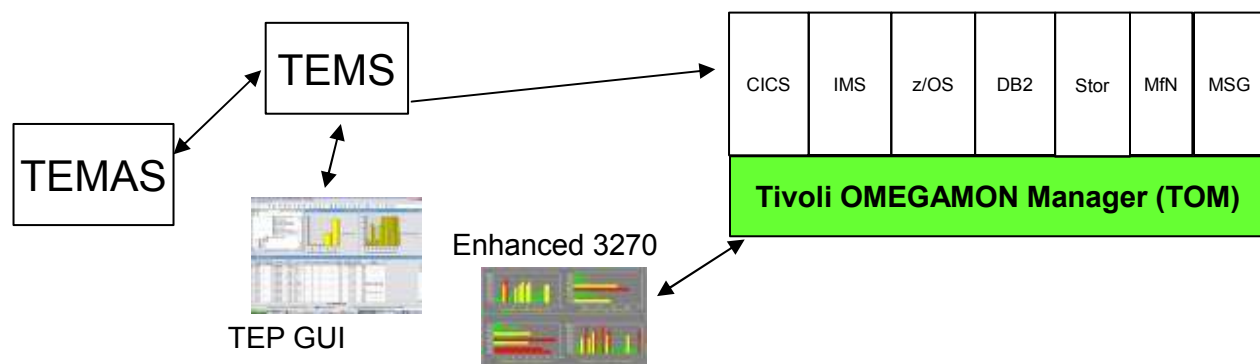
*“I like using the PARMGEN approach better than ICAT. I find it much easier to make things repeatable... I like the fact that PARMGEN does not overwrite my running members”*

*Typical quotes from early adopters program*

*The overall process has been simple and quick. Total time for 3-4 products (z/OS, CICS, DB2, TOM plain vanilla) has been about 2 hours Field Engineer*

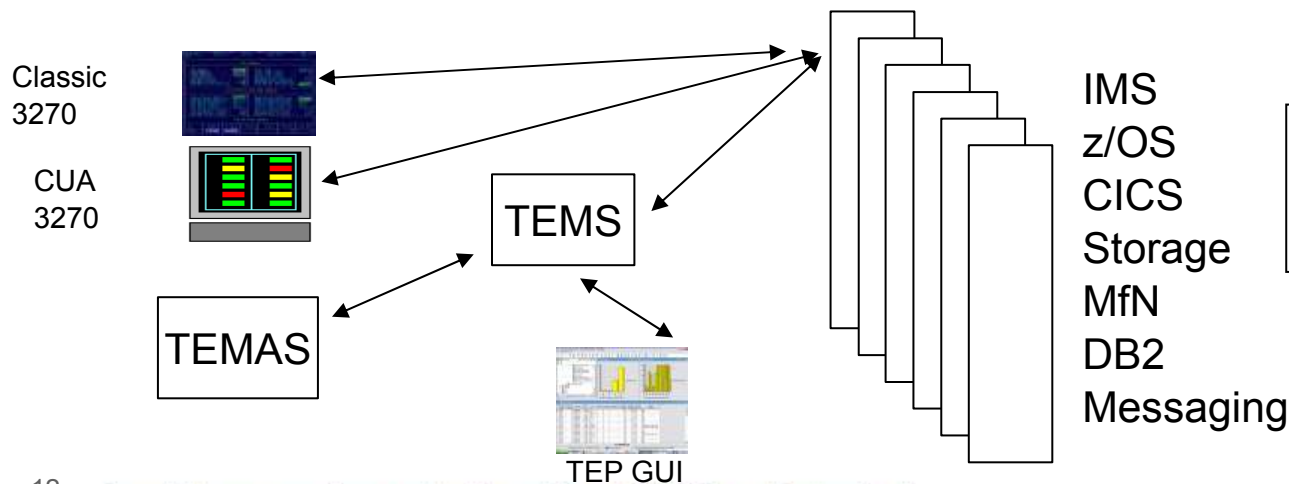
# Moving to simplified architecture driving decreased resource utilization with increased value

## Enhanced OMEGAMON Architecture



Single Manager and User Interface across OMEGAMON family

## Current OMEGAMON Architecture



Multiple Address Spaces and User Interfaces across each OMEGAMON

# OMEGAMON for Mainframe Networks V5.1/5.1.1 improves network diagnostics and management



In addition to OMEGAMON V5.1 family capability:

- Increased system availability with faster problem resolution through built-in problem solving scenarios
- Improved diagnostics and decreased CPU utilization
- Support for zEnterprise improves application availability
- Improved resource usage with more control over data collection
- Greater synergy with IBM Tivoli NetView for z/OS
- Improved management through additional Take Action commands
- Improved troubleshooting of data collection problems



# OMEGAMON for Mainframe Networks V5.1.1 provides additional problem solving and UI capabilities



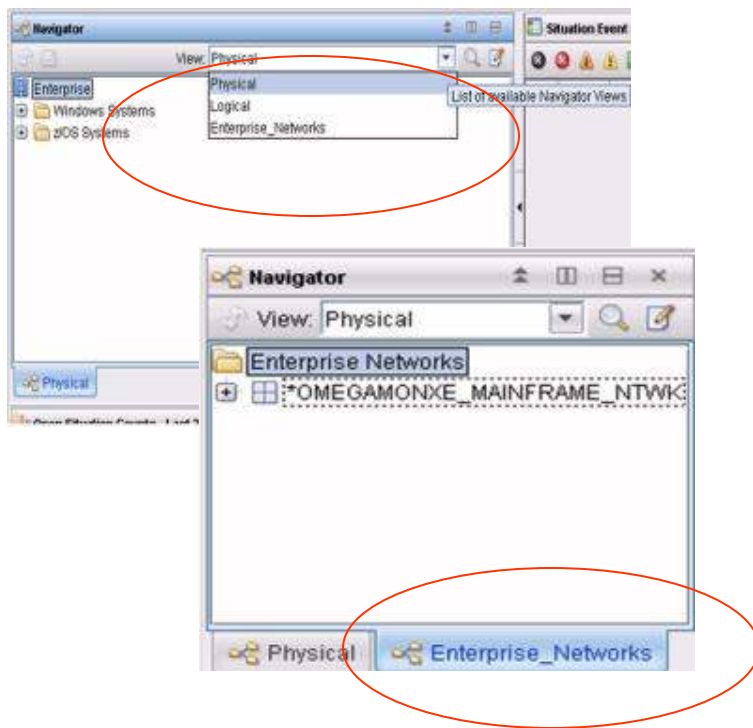
- Additional built-in problem solving scenarios:
  - **FTP sessions and transfers** - "hung" transfers, failed logins, applications transferring large numbers of files or data
  - **Enterprise Extender and HPR** - quickly identify performance problems impacting VTAM applications
  - **CSM storage usage** - applications holding excessive amounts of CSM storage
- Choice of user interfaces, with enterprise-wide workspaces to quickly identify, at a glance, poorly performing resources:
  - **OMEGAMON Enhanced 3270 User Interface** - speed and power of 3270
  - **Tivoli Enterprise Portal** - graphical user interface, showing network problems visually
  - **Find commands** enable resolution of network problems even faster



Version 5.1.1 = Version 5.1.0 + APARs OA42339 and OA42422 + Fix Pack 1

# Enterprise wide views and searches in the Tivoli Enterprise Portal: Enterprise\_Networks navigator

“As a network SME, I need to navigate quickly through the data, identify the source of a problem, and resolve the problem through take action commands in my current tool of choice, the Tivoli Enterprise Portal.”



Enterprise Networks Navigation	
	NAME
	Enterprise Application Health
	Enterprise Connections Find
	Enterprise Connections Health
	Enterprise EE Connections Overview
	Enterprise FTP Sessions Find
	Enterprise FTP Sessions Overview
	Enterprise FTP Transfers Find
	Enterprise HPR Connections Overview
	Enterprise HiperSockets Interfaces Overview
	Enterprise Interfaces Overview
	Enterprise OMEGAMON for Mainframe Networks Health
	Enterprise OSA Interfaces Overview
	Enterprise OSA-Express Channels Overview
	Enterprise OSA-Express Ports Overview
	Enterprise TN3270 Find
	Enterprise TN3270 Server Overview

# Enterprise wide searches: find TCP connections, FTP sessions, FTP transfers, or TN3270 sessions



Enterprise Connections Find - MC049219 - SYSADMIN

File Edit View Help

Enterprise Networks Navigation

Applications Summary

System ID	TCPIP STC Name	Application Name	Idle Time Since Last Accept	Connection Count	Active Connections	Active Connection High Water Mark	Connections In Backlog	Backlog Connections Rejected	Transmit Byte Rate	Receive Byte Rate	Percent Segments Retransmitted	Tot Segm Retrans
BP22	TCPIP22	M540DSST	0.02	83	63	63	0	0	0	0	0	0
BP22	TCPIP22	VHFDSA@L	0.41	41	20	21	0	0	122,619	39,404	6	0
BP22	TCPIP22	L3ITD@W0	0.00	32	16	16	0	0	433,506	94,668	0	0
BP22	TCPIP22	VHFDSA@L	0.01	32	12	12	0	0	25,808	51,152	0	0
BP22	TCPIP22	\$22SDSST	1.18	32	8	9	0	0	0	0	0	0
BP22	TCPIP22	BCD1DSST	0.00	29	9	9	0	0	13,481	6,483	0	0
BP22	TCPIP22	BCD1C5	0.02	25	4	4	0	0	6,433	13,431	0	0
BP22	TCPIP22	L3IAN@W0	0.01	24	4	4	0	0	1,605	33,935	0	0

Top 5 Applications - Total Backlog Connections Rejected

Connections in Backlog >= 10 OR Total Backlog Connections Rejected > 10

Enterprise Connections Find

At least one field must be specified as something other than \*\*

System ID  
TCPIP STC Name  
Remote IP Address  
Local IP Address  
Local Port  
Application Name  
Connection State

OK Cancel Help

System ID	TCPIP STC Name	Application	Connections	Total Backlog Connections	Backlog Connections Rejected	Backlog Connections Rejected Time Stamp	Connection Count	Active Connections	Accepted Connections	Connection Rate	Active Connection High Water Mark
BP22	TCPIP22	\$22SDSST	32	17	1	1	41	20	0	0	0
BP22	TCPIP22	\$22SM2	32	75	0	0	83	63	0	0	0
BP22	TCPIP22	\$22SM2	32	2985	0	0	32	8	0	0	0
BP22	TCPIP22	\$22SM2	32	53	0	0	11	10	0	0	0
BP22	TCPIP22	\$22SM2	32	1630	0	0	22	4	0	0	0

Top 5 Applications - Total Segments Retransmitted

Percent Out of Order Segments >= 5 OR Total Out of Order Segments > 15

System ID	TCPIP STC Name	Application Name	Percent Out of Order Segments	Total Out of Order Segments	Out of Order Segments	Total Segments Sent	Total Segments Received	Total Segments	Segments Sent	Segments Received	Application Type	Bsyslex Name
SYS	TCPIP0	S8HUBLL	0	74	0	223476	228300	451776	272	220	Unknown	LPAR400J

Hub Time: Mon, 07/22/2013 06:05 PM

Server Available

Enterprise Connections Find - MC049219 - SYSADMIN



# Increased System Availability with faster problem resolution in the OMEGAMON Enhanced 3270UI



## KN3ENTMN Enterprise Network Workspaces

Select one of the following, then press ENTER

- 1. A Enterprise Application Health
- 2. L Enterprise TCP Listeners Overview
- 3. C Enterprise Connections Health
- 4. N Enterprise TN3270 Servers Overview
- 5. I Enterprise Interfaces Overview
- 6. O Enterprise OSA Interfaces Overview
- 7. H Enterprise HiperSockets Interfaces Overview
- 8. P Enterprise OSA Express Ports Overview
- 9. B Enterprise OSA Express Channels Overview
- 10. T Enterprise TCPIP Stack Performance Overview
- 11. M Enterprise Memory and CSM Storage Overview
- 12. F Enterprise FTP Sessions Overview
- 13. G Enterprise FTP Transfers Overview
- 14. R Command and Response Log
- 15. V Enterprise VTAM Workspaces

## KN3ENTVT Enterprise VTAM Workspaces

Select one of the following, then press ENTER

- 1. A Enterprise Extender and HPR Health
- 2. B Enterprise Extender Connections Overview
- 3. H Enterprise HPR Connections Overview
- 4. R Command and Response Log
- 5. E Enterprise Network Workspaces

# YouTube videos of problem solving scenarios:



The screenshot shows the YouTube channel page for 'Service Management Connect'. The channel name is at the top, with a 'Subscribe' button and '418' subscribers. Below the channel name is the playlist title 'OMEGAMON XE for Mainframe Networks'. The playlist controls show '11 videos • 43 views'. Three video thumbnails are visible:

- 1 What's New with OMEGAMON XE for Mainframe Networks?**  
by ismconnect 46 views  
This video describes the capabilities of the Guest Relocations Tab on the OMEGAMON XE on z/VM and Linux v4.3.0 Dashboards. (3:39)
- 2 Diagnosing Slow Response Times to a Business Partner's Applications**  
by ismconnect 17 views  
In this scenario, an operator uses the OMEGAMON XE for Mainframe Networks enhanced 3270 user interface to determine the reason for slow response times to a Business Partners applications: packets are being retransmitted over enterprise extender (EE) connections due to a network issue. (2:52)
- 3 Troubleshooting Applications with Poor FTP Performance**  
by ismconnect 15 views  
In this scenario, a networking expert uses the OMEGAMON XE for Mainframe Networks enhanced 3270 user interface to diagnose a problem with file transfer performance. (2:26)

[http://www.youtube.com/playlist?list=PLiD3\\_RDV00Jcpfl2GCf2mPqprba2KZCsP](http://www.youtube.com/playlist?list=PLiD3_RDV00Jcpfl2GCf2mPqprba2KZCsP)



## Scenario: Why can't users access an application?

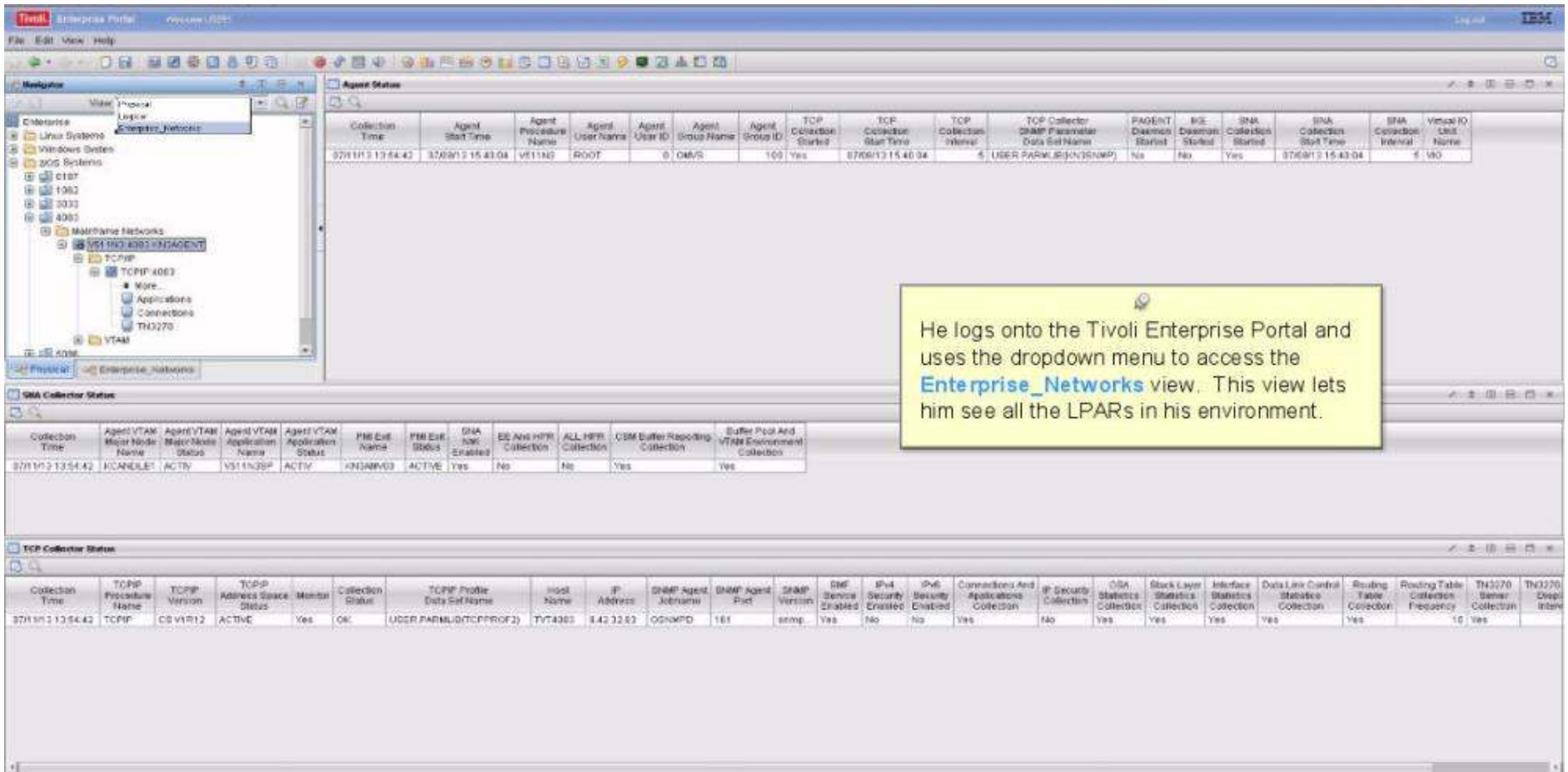
### The setting:

Saurabh, the network expert, is receiving reports of several users having issues accessing an application. He has one user's IP address and plans to use it to research this issue.

He decides to try the new OMEGAMON for Mainframe Networks Enterprise Connection Find workspace to debug the problem.



# Why can't users access an application?



He logs onto the Tivoli Enterprise Portal and uses the dropdown menu to access the **Enterprise\_Networks** view. This view lets him see all the LPARs in his environment.

Collection Time	Agent Start Time	Agent Procedure Name	Agent User Name	Agent User ID	Agent Group Name	Agent Group ID	TCP Collection Started	TCP Collection Start Time	TCP Collection Interval	TCP Collector SHMP Parameter Data Set Name	AGENT Daemon Started	BE Daemon Started	SNA Collection Started	SNA Collection Start Time	SNA Collection Interval	Virtual IO Unit Name
3/7/11 13:13:54.42	3/7/11 13:15:43.04	V511N3	ROOT	0	OMVS	100	Yes	3/7/11 13:15:40.04	5	USER.PARMLIB(UCPRPROF2)	No	No	Yes	3/7/11 13:15:43.04	5	180

Collection Time	Agent VTAM Major Node Name	Agent VTAM Major Node Status	Agent VTAM Application Name	Agent VTAM Application Status	PM Exit Name	PM Exit Status	SNA Job Enabled	BE And HPR Collection	ALL HPR Collection	OSM Buffer Reporting Collection	Buffer Pool And VTAM Environment Collection
3/7/11 13:13:54.42	KCANELET	ACTV	V511N3SP	ACTV	KN3AMV03	ACTIVE	Yes	No	No	Yes	Yes

Collection Time	TCP Profile Name	TCP Profile Version	TCP Profile Address Space Status	Monitor	Collection Status	TCP Profile Data Set Name	Host Name	IP Address	SHMP Agent Job Name	SHMP Agent Port	SHMP Version	SHMP Service Enabled	IPv4 Security Enabled	IPv6 Security Enabled	Connections And Applications Collection	IP Security Collection	OSM Statistics Collection	Stack Layer Statistics Collection	Interface Statistics Collection	Data Link Control Statistics Collection	Routing Table Collection	Routing Table Collection Frequency	Th3270 Banner Collection	Th3270 Deep Interm
3/7/11 13:13:54.42	UCPR	CS V1R12	ACTIVE	Yes	OK	UCPR.PARMLIB(UCPRPROF2)	TV74303	8.42.32.83	OSMCPD	161	snmp	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	10	Yes	

# Why can't users access an application?



Thvok Enterprise Portal

Enterprise Networks Navigation

Applications Summary

System ID	TCP/IP STC Name	Application Name	Idle Time Since Last Accept	Connection Count	Active Connections	Active Connection High Water Mark	Connections in Backlog	Backlog Connections Rejected	Transmit Byte Rate	Receive Byte Rate	Percent Segments Retransmitted	Total Segments Retransmitted	Total Backlog Connections Rejected	Percent Out of Order Segments	Out of Order Segments
0061	TCP/IP	V511DGBT	0.03	31	14	14	0	0	7,470	174,313	0	1248	0	1	
0061	TCP/IP	V511N3	44.97	25	5	7	0	0	84,810	368	0	21	0	0	
0061	TCP/IP	L423N3	218.64	18	6	6	0	0	0	0	0	62	0	0	
0181	TCP/IP	V511N3	18.51	16	3	3	0	0	61,228	417	0	1	0	0	
LP03	TCP/IP	V511N3	18.10	17	3	3	0	0	25,330	246	1	538	0	0	
0181	TCP/IP	V423N3	18.86	15	4	4	0	0	247	16	0	0	0	0	
0181	TCP/IP	V7AX	0.30	5	0	0	0	0	0	52	0	0	0	0	
0061	TCP/IP	V7AX	0.00	5	0	0	0	0	74	50	0	0	0	0	
0061	TCP/IP	INET4		4	0	0	0	0	0	0	0	0	0	0	

Enterprise Connections Find workspace selected in Enterprise Network Navigation view.

Top 5 Applications - Total Backlog Connections Rejected

Top 5 Applications - Total Segments Retransmitted

Percent Segments Retransmit - 3 OR Total Segments Retransmit - 18

System ID	TCP/IP STC Name	Application Name	Percent Segments Retransmitted	Total Segments Retransmitted	Segments Retransmitted	Retransmission Rate	Connection Count	Active Connections	Accepted Connections	Connection Rate	Application Type	System Name
LP03	TCP/IP	V511N3	1	538	2	0	17	3	0	0	Unknown	PLEX1
LP03	TCP/IP	TN3270	0	23	0	0	1	0	0	0	TN3270_Sender	PLEX1
0061	TCP/IP	TN3270	0	4580	0	0	1	0	0	0	TN3270_Sender	PLEX3
0061	TCP/IP	V511DGBT	0	1248	0	0	31	14	2	0	Unknown	PLEX3
0061	TCP/IP	L423N3	0	62	0	0	18	6	0	0	Unknown	PLEX3
0061	TCP/IP	V511N3	0	21	0	0	25	5	0	0	Unknown	PLEX3

Percent Out of Order Segments - 6 OR Total Out of Order Segments - 15

System ID	TCP/IP STC Name	Application Name	Percent Out of Order Segments	Total Out of Order Segments	Out of Order Segments	Total Segments Sent	Total Segments Received	Segments Sent	Segments Received	Application Type	System Name	
0061	TCP/IP	V511DGBT	1	576	9	427360	582543	869903	402	1086	Unknown	PLEX3



# Why can't users access an application?



The screenshot displays the Enterprise Portal interface with several monitoring components:

- Applications Summary Table:**

System ID	TCP/IP STC Name	Application Name	Idle Time Since Last Accept	Connection Count	Active Connections	Active Connection High Water Mark	Connections in Backlog	Backing Connections Rejected	Transmit Byte Rate	Receive Byte Rate	Percent Segments Retransmitted	Total Segments Retransmitted	Total Backlog Connections Rejected	Percent Out of Order Segments	Out of Order Segments
0061	TCP/IP	V5110GGT	0.03	26	14	14	0	0	7,701	174,361	0	1279	0	0	0
0061	TCP/IP	V511N3	47.65	26	5	7	0	0	95,954	448	0	21	0	0	0
0061	TCP/IP	L422N3	214.22	16	6	6	0	0	247	15	0	64	0	0	0
0161	TCP/IP	V511N3	22.19	16	3	3	0	0	56,835	275	0	2	0	0	0
0163	TCP/IP	V511N3	21.68	17	3	3	0	0	25,916	106	1	704	0	0	0
0161	TCP/IP	V422N3	22.44	15	4	4	0	0	0	0	0	0	0	0	0
0161	TCP/IP	VTAM	0.00	5	0	0	0	0	74	55	0	0	0	0	0
0061	TCP/IP	V511N3	0.00	0	0	0	0	0	74	44	0	0	0	0	0
0061	TCP/IP	V511N3	0.00	0	0	0	0	0	0	0	0	0	0	0	0
- Enterprise Connections Find Dialog:**

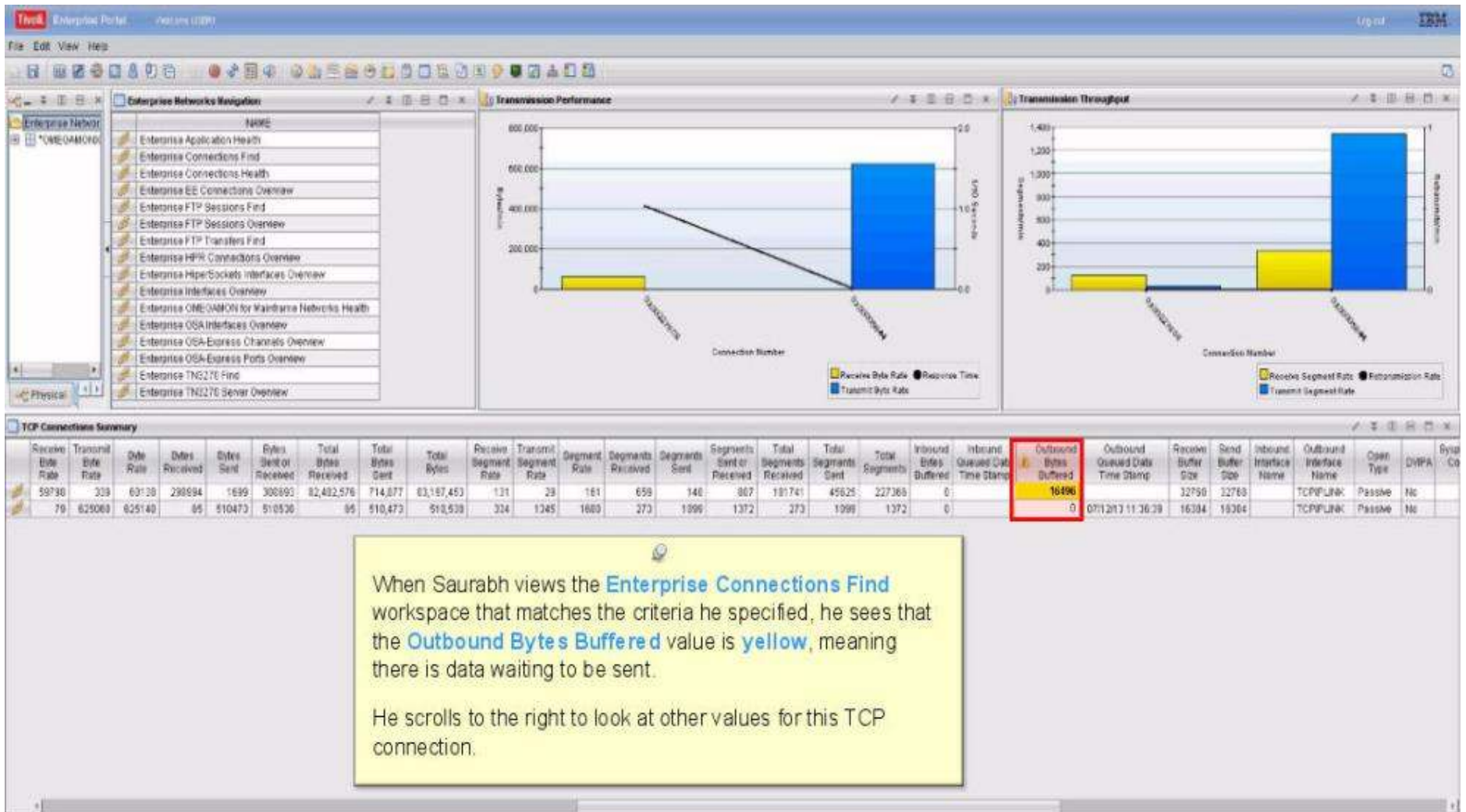
System ID: \*  
 TCP/IP STC Name: \*  
 Remote IP Address: \*  
 Local IP Address: \*  
 Local Port: \*  
 Application Name: \*  
 Connection State: \*
- Top 5 Applications - Total Backlog Connections Rejected:** A bar chart showing backlog connections for various applications.
- Top 5 Applications - Total Segments Retransmitted:** A bar chart showing retransmitted segments for various applications.
- Top 5 Applications - Total Out of Order Segments:** A bar chart showing out of order segments for various applications.
- Percent Segments Retransmitted >= 3 or Total Segments Retransmitted >= 10:**

System ID	TCP/IP STC Name	Application Name	Percent Segments Retransmitted	Total Segments Retransmitted	Segments Retransmitted	Retransmission Rate	Connection Count	Active Connections	Accepted Connections	Connection Rate	Application Type	System Name
L103	TCP/IP	V511N3	36	36	4	0	17	3	0	0	Unknown	PL63
L103	TCP/IP	TN3279	36	36	0	0	0	0	0	0	Unknown	PL63
0061	TCP/IP	TN3279	36	36	0	0	0	0	0	0	Unknown	PL63
0061	TCP/IP	V5110GGT	36	36	0	0	0	0	0	0	Unknown	PL63
0061	TCP/IP	L422N3	36	36	0	0	0	0	0	0	Unknown	PL63
0061	TCP/IP	V511N3	36	36	0	0	0	0	0	0	Unknown	PL63
- Percent Out of Order Segments >= 5 OR Total Out of Order Segments >= 10:**

System ID	TCP/IP STC Name	Application Name	Percent Out of Order Segments	Total Out of Order Segments	Out of Order Segments Sent	Segments Received	Segments	Sent	Received	Type	Name	
0061	TCP/IP	V5110GGT	0	658	0	445662	639135	1054917	422	1086	Unknown	PL63



# Why can't users access an application?



The screenshot displays the Enterprise Portal interface with three main panels: Enterprise Networks Navigation, Transmission Performance, and Transmission Throughput. Below these is a TCP Connections Summary table. A yellow highlight is placed on the 'Outbound Bytes Buffered' column for a specific connection, showing a value of 16496. A text box explains that this yellow value indicates data waiting to be sent.

Receive Byte Rate	Transmit Byte Rate	Idle Rate	Bytes Received	Bytes Sent	Bytes Sent or Received	Total Bytes Received	Total Bytes Sent	Total Bytes	Receive Segment Rate	Transmit Segment Rate	Segment Rate	Segments Received	Segments Sent	Segments Sent or Received	Total Segments Received	Total Segments Sent	Total Segments	Inbound Bytes Buffered	Inbound Queued Data Time Stamp	Outbound Bytes Buffered	Outbound Queued Data Time Stamp	Receive Buffer Size	Send Buffer Size	Inbound Interface Name	Outbound Interface Name	Open Type	DWPA	Byte Co
59790	339	60128	290894	1699	300893	82,402,576	714,877	83,187,453	131	29	161	659	146	807	181741	45625	227368	0		16496		32750	32760	TCPFLINK	TCPFLINK	Passive	No	
79	625069	625140	85	510473	510530	95	510,473	510,530	334	1245	1680	273	1996	1372	273	1999	1372	0		0	07/12/13 11:36:29	16394	19364	TCPFLINK	TCPFLINK	Passive	No	

When Saurabh views the **Enterprise Connections Find** workspace that matches the criteria he specified, he sees that the **Outbound Bytes Buffered** value is **yellow**, meaning there is data waiting to be sent.

He scrolls to the right to look at other values for this TCP connection.

# Why can't users access an application?



The screenshot displays the IBM Enterprise Portal interface. On the left is a navigation tree for 'Enterprise Networks'. The main area contains three charts: 'Transmission Performance', 'Transmission Throughput', and 'TCP Connections Summary'. The 'TCP Connections Summary' table is highlighted, showing two rows of data. The second row is highlighted in yellow and has a red box around its performance metrics.

System ID	TCP STC Name	Application Name	Local IP Address	Local Port	Remote IP Address	Remote Port	Hex Connector Number	Connector State	Connection Start Time	Connection Duration	Time Since Last Activity	Response Time	Response Time Variance	Retransmission Rate	Percent Segments Retransmitted	Segments Retransmitted	Total Segments Retransmitted	Percent of Order Segments	Out of Order Segments	Total Out of Order Segments	Duplicate ACKs	Congestion Window Size	Local Window Size	Frequency
0065	TCPNP	TN3270	8.42.45.81	23	8.42.40.88	1790	000024CARE	ESTABLISHED	07/12/13 11:36:19	00:41:46	00:00:15.7	11.82	0.62	6	13	20	0	0	0	0	740	524	0	
0065	TCPNP	VS11000T	8.42.45.81	2110	8.42.40.88	1775	0000276C0	ESTABLISHED	07/11/13 12:57:55	23:22:10	00:00:12.3	1.82	2.57	0	0	0	1	0	0	0	0	59534	0	

**Callout Box Text:**  
 He finds other values that are out of range: response times are high and a high percentage of TCP segments were retransmitted.  
 He clicks on the Link icon on this row to get more information about this TCP connection.





# Why can't users access an application?



This workspace provides more detail about the TCP connection, but nothing jumps out at Saurabh as the underlying cause of the problem.

He decides to run a `tracerte` command for this IP address to determine if the underlying problem is a network issue.

Connection State	Connection Start Time	Time Since Last Activity	Connection Duration	Response Time	Response Time Variance
ESTABLISHED	07/12/13 11:38:19	00:00:16.72	00:41:46	11.82	6.92

Retransmission Rate	Percent Segments Retransmitted	Segments Retransmitted
0	13	33

Receive Rate	Transmit Rate	Byte Rate	Bytes Received	Bytes Sent	Bytes Sent or Received	Total Bytes Received	Total Bytes Sent	Total Bytes	Receive Segment Rate	Transmit Segment Rate	Segment Rate	Segments Received	Segments Sent or Received	Segments Sent	Total Segments Received	Total Segments Sent	Total Segments	Inbound Bytes Buffered	Inbound Queued Data Time Stamp	Outbound Bytes Buffered	Outbound Queued Data Time Stamp	Inbound Interface Name	Outbound Interface Name
0	20966	20966	0	104832	104832	81	700,628	701,609	37	50	87	185	436	251	1297	1620	2917	0		12228	07/12/13 12:19:03	TOPPLINK	

System ID	TCP STC Name	Application Name	ASID	Local IP Address	Local Port	Remote IP Address	Remote Port	Conn. Type	CVIPA	System Cluster Connection Type	Maximum Segment Size	Slow Start Threshold	Registered Auxiliary Inbound Queue	Receive Buffer Size	Send Buffer Size	APPLDATA	Hex Connection Number	Server Resource ID
0361	TCPMP	TN3270	030023	9.42.45.51	33	9.42.40.56	1790	Passive	No		576	873	No	16384	16384	E327NS	001024C48E	0000000010

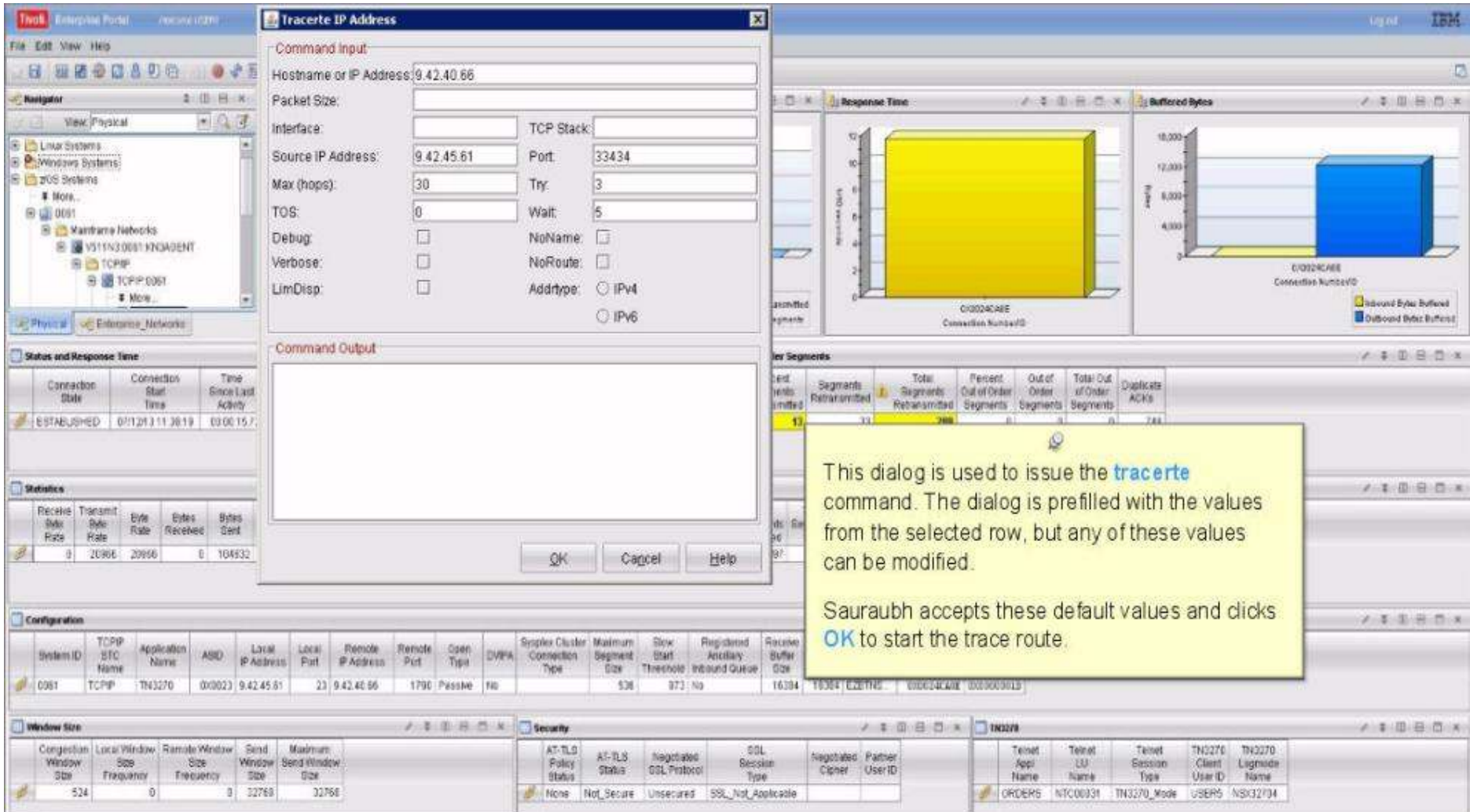
Congestion Window Size	Local Window Size Frequency	Remote Window Size Frequency	Send Window Size	Maximum Send Window Size
524	0	0	32768	32768

AT-TLS Policy Status	AT-TLS Status	Negotiated SSL Protocol	SSL Session Type	Negotiated Cipher	Partner User ID
None	Not_Secure	Unsecured	SSL_Not_Applicable		

Tenet Appl Name	Tenet LU Name	Tenet Session Type	TN3270 Client User ID	TN3270 Logname Name
ORDERS	NTC00301	TN3270_Mode	USER05	NSR3270M



# Why can't users access an application?



**Tracert IP Address**

Command Input:

Hostname or IP Address: 9.42.40.66

Packet Size: [ ]

Interface: [ ] TCP Stack: [ ]

Source IP Address: 9.42.45.61 Port: 33434

Max (hops): 30 Try: 3

TOS: 0 Wait: 5

Debug:  NoName:

Verbose:  NoRoute:

LimDisp:  Addtype:  IPv4  IPv6

Command Output:

OK Cancel Help

**Configuration Table:**

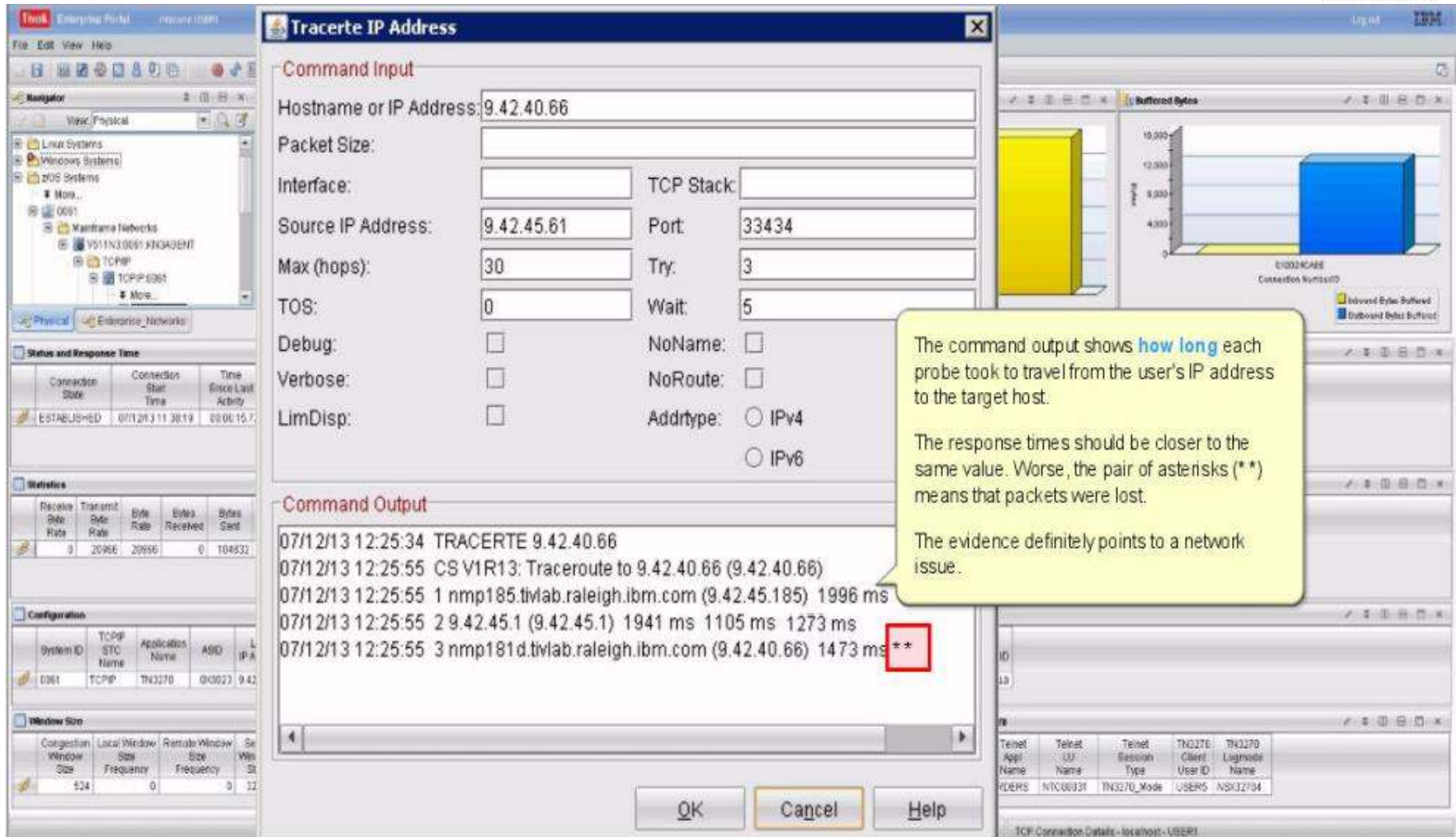
System ID	TCP/IP Name	Application Name	ASID	Local IP Address	Local Port	Remote IP Address	Remote Port	Open Type	DVWA	Simplex Cluster Connection Type	Maximum Segment Size	Slow Start Threshold	Registered Ancillary Inbound Outbound	Receive Buffer Size
0081	TCP/IP	TN3270	0x0023	9.42.45.61	23	9.42.40.66	1790	Passive	No		536	873	No	16384

**Callout Box:**

This dialog is used to issue the **tracerte** command. The dialog is pre-filled with the values from the selected row, but any of these values can be modified.

Saurabh accepts these default values and clicks **OK** to start the trace route.

# Why can't users access an application?



**Command Input**

Hostname or IP Address: 9.42.40.66

Packet Size: [ ]

Interface: [ ] TCP Stack: [ ]

Source IP Address: 9.42.45.61 Port: 33434

Max (hops): 30 Try: 3

TOS: 0 Wait: 5

Debug:  NoName:

Verbose:  NoRoute:

LimDisp:  Addrtype:  IPv4  
 IPv6

**Command Output**

```
07/12/13 12:25:34 TRACERTE 9.42.40.66
07/12/13 12:25:55 CS V1R13: Traceroute to 9.42.40.66 (9.42.40.66)
07/12/13 12:25:55 1 nmp185.tivlab.raleigh.ibm.com (9.42.45.185) 1996 ms
07/12/13 12:25:55 2 9.42.45.1 (9.42.45.1) 1941 ms 1105 ms 1273 ms
07/12/13 12:25:55 3 nmp181d.tivlab.raleigh.ibm.com (9.42.40.66) 1473 ms **
```

**Callout Box:**

The command output shows **how long** each probe took to travel from the user's IP address to the target host.

The response times should be closer to the same value. Worse, the pair of asterisks (\*\*) means that packets were lost.

The evidence definitely points to a network issue.

# Why can't users access an application?

Using **tracerte**, Saurabh has determined that the problem is a network issue. He sends this trouble ticket to the IT support group for resolution.

The OMEGAMON for Mainframe Networks FIND function helped Saurabh to quickly identify the source of his problem and move toward a resolution.



## Scenario:

What is slowing down my business partner's applications?

### The setting:

Annette is an Operations Analyst.

Today, she received reports of slow response time with a Business Partner's application. She knows that the Business Partner's network is connected to her company's network through Enterprise Extender (EE) Connections..



# What is slowing down my business partner's applications?



```

netmenu_ File Edit View Tools Options Help 06/26/2013 15:57:14
Auto Update : Off
Command ==>
KOBSTART Enterprise Summary Plex ID :
Sys ID :
    
```

Network Health for Applications

Columns 3 to 7 of 21    Rows 1 to 4 of 4

ΔSystem ▽ID	ΔJob ▽Name	Δ% Segs ▽OutOfOrder	ΔTot Segs ▽OutOfOrder	ΔConn in ▽Backlog	Backlog Rejected	ΔTot Bac ▽Rejecte
_ 0181	TN3270	0	0	0	0	0
_ 1062	V511N3	0	0	0	0	0
_ 4083	V511DSST	0	7	0	0	0
_ LP03	V511N3	0	0	0	0	0

To solve this problem, Annette logs on to the OMEGAMON for Mainframe Networks enhanced 3270 user interface (3270UI) and types `netmenu` to access the list of Enterprise workspaces.

# What is slowing down my business partner's applications?



```
File Edit View Tools Options Help 06/26/2013 16:00:30
Auto Update : Off

Command ==>
KOBSTART

Columns
ΔSystem Δ
▽ID ▽
_ 0181
_ 1062
_ 4083
_ LP03

KN3ENTMN Enterprise Network Workspaces

Select one of the following, then press ENTER
v_ 1. A Enterprise Application Health
   2. L Enterprise TCP Listeners Overview
   3. C Enterprise Connections Health
   4. N Enterprise TN3270 Servers Overview
   5. I Enterprise Interfaces Overview
   6. O Enterprise OSA Interfaces Overview
   7. H Enterprise HiperSockets Interfaces Overview
   8. P Enterprise OSA Express Ports Overview
   9. B Enterprise OSA Express Channels Overview
  10. T Enterprise TCPIP Stack Performance Overview
  11. M Enterprise Memory and CSM Storage Overview
  12. F Enterprise FTP Sessions Overview
  13. G Enterprise FTP Transfers Overview
  14. R Command and Response Log
  15. V Enterprise VTAM Workspaces

_ | 0 | x
4
Tot Bac
Rejecte
0
0
0
0
```

She types **v** to select the Enterprise VTAM Workspaces menu.



# What is slowing down my business partner's applications?



File Edit View Tools Options Help 06/26/2013 16:03:14  
Auto Update : Off

Command ==>  
KOBSTART

KN3ENTVT Enterprise VTAM Workspaces

Select one of the following, then press ENTER

- A 1. A Enterprise Extender and HPR Health
- 2. B Enterprise Extender Connections Overview
- 3. H Enterprise HPR Connections Overview
- 4. R Command and Response Log
- 5. E Enterprise Network Workspaces

Columns	ΔSystem	ΔVID							Tot Bac	Rejecte
	0181								0	
	1062	V511N3	0	0	0	0	0	0	0	
	4083	V511DSST	0	7	0	0	0	0	0	
	LP03	V511N3	0	0	0	0	0	0	0	

She types **A** to access the Enterprise Extender and HPR Health workspace.





# What is slowing down my business partner's applications?



File Edit View Tools Options Help 06/26/2013 16:08:42  
Auto Update : Off  
Command ==> VTAM : \*  
KN3EEC02 Enterprise EE and HPR Connections Health SMF ID : \*

EE Connections with High Percent Packets Retransmitted

Columns 3 to 7 of 18 Rows 1 to 1 of 1

System ID	PU Name	Δ% Pkts ∇Retrans	ΔTransmit ∇Byte Rate	ΔReceive ∇Byte Rate	ΔRTP ∇Pipes	ΔSessions ∇
0181	EEXSWPD2	11	84.4K	82.5K	3	5

From this workspace, she finds an EE connection with a high % Packets Retransmitted value. Any values over 5 are considered high.  
This indicates a network problem affecting the EE connection.

# What is slowing down my business partner's applications?



```
File Edit View Tools Options Help 06/26/2013 16:08:42
Auto Update : Off
Command ==>
KN3EEC02 Enterprise EE and HPR Connections Health VTAM : *
SMF ID : *
```

EE Connections with High Percent Packets Retransmitted

Columns 3 to 7 of 18 Rows 1 to 1 of 1

System ID	PU Name	Δ% Pkts ∇Retrans	ΔTransmit ∇Byte Rate	ΔReceive ∇Byte Rate	ΔRTP ∇Pipes	ΔSessions ∇
S 0181	EEXSWPD2	11	84.4K	82.5K	3	5

She wants to investigate further, so she types an S by the System ID to get more information.

# What is slowing down my business partner's applications?



File Edit View Tools Options Help 06/26/2013 16:27:04  
 Auto Update : Off  
 VTAM : VTAM  
 SMF ID : 0181

Command ==>  
 KN3EEDS EE Connection Summary for EEXSWPD2

**EE Connection Details**

Columns 2 to 7 of 12 Rows 1 to 5 of 5

ΔLocal/Remote ▽Port	ΔType of ▽Service	ΔTran ▽Byte	Bytes Received	ΔTra ▽Pkt
— 12000	Signal		0	
— 12001	Network		0	
— 12002	High		0	
— 12003	Medium		405.3K	
— 12004	Low		0	

In the **EE Connection Details** workspace for this connection, Annette finds a list of HPR connections flowing over this EE connection.

She observes an HPR connection with a yellow **ARB Mode** status, indicating network congestion or packet loss.

**HPR Connections Summary**

Columns 2 to 6 of 17 Rows 1 to 3 of 3

ΔLocal RTP ▽PU Name	ARB Mode	Δ% Pkts ▽Retrans	ΔUnacknowledged ▽Buffers	ΔOutOfSequence ▽Buffers	ΔSmoot ▽Round
— CNR00013	Yellow	12	4	0	
— CNR00016	Green	0	0	0	
— CNR00015	Green	0	0	0	

# What is slowing down my business partner's applications?



File Edit View Tools Options Help 06/26/2013 16:27:04  
 Auto Update : Off  
 VTAM : VTAM  
 SMF ID : 0181

Command ==> EE Connection Summary for EEXSWPD2

KN3EEDS

EE Connection Details

Columns 2 to 7 of 12 Rows 1 to 5 of 5

ΔLocal/Remote ▽Port	ΔType of ▽Service	ΔTransmit ▽Byte Rate	ΔReceive ▽Byte Rate	ΔBytes ▽Sent	ΔBytes ▽Received	ΔTra ▽Pkt
— 12000	Signal	0	0	0	0	
— 12001	Network	11	0	55	0	
— 12002	High	59.6K	0	298.3K	0	
T — 12003	Medium	50.2K	81.0K	251.0K	405.0K	
— 12004	Low	0				

In the **EE Connection Details** table, she observes a normal distribution of traffic over the types of service.

HPR Connections Su

Columns 2 to 6 of 17 Rows 1 to 3 of 3

ΔLocal RTP ▽PU Name	ARB Mode	Δ% Pkts ▽Retrans	ΔU ▽B	ΔSmoot ▽Round
— CNR00013	Yellow	12		
— CNR00016	Green	0		
— CNR00015	Green	0		

She decides to issue a **tracerte** (T) command to determine the route that packets follow and response time for each hop. Since the Remote IP Address is the same for all five ports, she can choose any of the EE Connection Details rows.



# What is slowing down my business partner's applications?

```
KN3ACTT      Tracerte IP Address

Press ENTER to continue

Hostname/IP Address: 9.42.40.65
Source IP Address  :
Interface:          Packet Size: 256   Port: 33434
TCP Stack:          Max(hops): 30   Try: 3   TOS: 0   Wait: 5
Enter "/" to select option  Addrtype
_ Debug             _ 1. IPv4
_ Verbose           _ 2. IPv6
_ LimDisp
_ NoName
_ NoRoute
```

She reviews the **tracerte** command options. She could customize this command to specify, for example, a different packet size or a greater number of tries.

She accepts the defaults and presses **Enter** to execute the command.

# What is slowing down my business partner's applications?



File Edit View Tools Options Help 06/26/2013 16:39:29  
Auto Update : Off  
TCP STC : \*  
SMF ID : \*

Command ==>  
KN3CRTS

### Command and Response Log

Command Log			
Columns	1 to 4 of 7	Rows	1 to 1 of 1
Command Timestamp	Command	Return Code	Response Message
13/06/26 11:45:28	tracerte 9.42.4	0	KN3A001I PROCESSING CO

Command Response			
Columns	1 to 2 of 2	Rows	1 to 4 of 4
Command Timestamp	+Command Output		
13/06/26 16:46:29	CS V1R13: Traceroute to 9.42.40.65 (9.42.40.65)		
13/06/26 16:46:29	1 nmp185.tivlab.raleigh.ibm.com (9.42.45.185) 2 ms		
13/06/26 16:46:29	2 9.42.45.1 (9.42.45.1) 10 ms * *		
13/06/26 16:46:29	3 hpr61.tivlab.raleigh.ibm.com (9.42.40.65) 3 ms *		

The **Command and Response Log** workspace shows the results of the **tracerte** command.

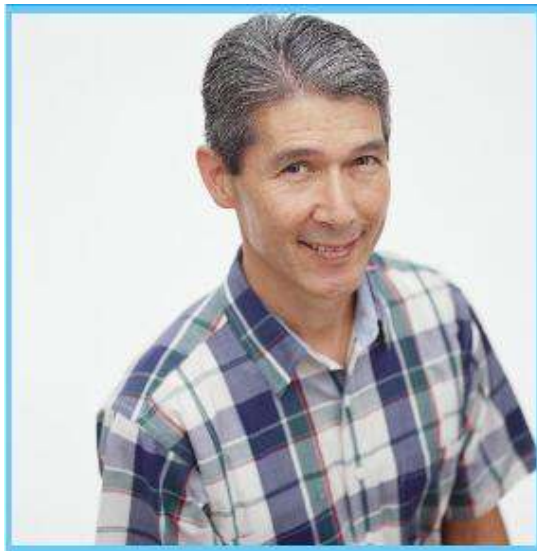
The tracerte command response shows **multiple IP hops** between EE endpoints and **lost ICMP packets**, represented by asterisks (\*), on some IP hops.



# What is slowing down my business partner's applications?

Annette contacts her IT network support lead, Jim, to resolve the lost packets issue.

OMEGAMON XE for Mainframe Networks quickly identified the performance issues with enterprise extenders, so the problem could be resolved quickly and efficiently.



## Scenario: Scheduled logons and “silent” failures

### The setting:

A mainframe network systems programmer was building a baseline for network performance of his LPARs and applications. A very high number of rejected connections were being reported by OMEGAMON XE for Mainframe Networks just after 10 pm each evening. At first, the systems programmer thought he had found a problem with the monitoring software.



# Scheduled logons and “silent” failures

1. Johann, the network systems programmer, enabled a situation that e-mails him when backlog connections are rejected.

	System ID	Application Name	Local Port	Connections in Backlog	Backlog Limit	Backlog Connections Rejected	Total Backlog Connections Rejected	Backlog Connections Rejected Time Stamp
	MVSB	PORTMAP1	111	0	2	0	6	08/18/11 14:54:40
	MVSB	DB2SDIST	5446	5	10	0	0	
	MVSC	PORTMAP1	111	0	2	0	6	08/18/11 14:11:03
	MVSA	CXEGDSST	1920	0	10	0	7	08/20/11 10:05:35
	MVSA	PORTMAP1	111	0	2	0	6	08/18/11 14:35:27
	MVSA	CXEGDSST	1920	0	10	0	7	08/18/11 14:57:13

2. The e-mails confirmed that thousands of connection requests were being rejected before the FTP server was able to accept.

**BacklogConnsRejected** - The number of rejected backlog connections for FTPD1 on SYSXX is **6,842**: 11/16/09 22:07EST.

**BacklogConnsRejected** - The number of rejected backlog connections for FTPD1 on SYSXX is **8,045**: 11/17/09 22:06EST.

# Scheduled logons and “silent” failures ...



**3** The network experts starts at the KN3START Enterprise Applications Health workspace.

**4** She types the alias, **NETWORK**, and presses **Enter** to bring up the Enterprise Network Workspaces menu.

**5** She selects **a** to display the Enterprise Application Health workspace and presses **Enter**.

ΔSystem VID	ΔJob VName	Δ% Segs VOutOfOrder	ΔTot Segs VOutOfOrder	ΔConn in VBacklog	Backlog Rejected	ΔTot Bac VRejecte
1062	FTPD1	47	16	4	10	10
1062	FTPD1	1	0	0	0	1.5K
3033	V510N3	0	0	0	0	0
0023	V510q	0	0	0	0	0

ΔSystem VID	ΔJob VName	Δ% Segs VOutOfOrder	ΔTot Segs VOutOfOrder	ΔConn in VBacklog	Backlog Rejected	ΔTot Bac VRejecte
1062	FTPD1	47	16	4	10	10
1062	FTPD1	1	0	0	0	1.5K
3033	V510N3	0	0	0	0	0
0023	V510q	0	0	0	0	0

KN3ENTMN Enterprise Network Workspaces

Select one of the following, then press ENTER

1. A Enterprise Application Health
2. L Enterprise TCP Listeners Overview
3. C Enterprise Connections Health
4. N Enterprise TN3270 Server Overview
5. I Enterprise Interfaces Overview
6. O Enterprise OSA Interfaces Overview
7. H Enterprise HiperSocket Interfaces Overview
8. P Enterprise OSA Express Ports Overview
9. B Enterprise OSA Express Channels Overview
10. T Enterprise TCPIP Stack Performance Overview
11. M Enterprise Memory and CSM Storage Overview
12. R Command and Response Log

# Scheduled logons and “silent” failures ...

File Edit View Tools Options Help 10/09/2012 09:21:30  
 Command ==> Enterprise Applications Health  
 KN3TAPO Auto Update : Off  
 TCP STC : \*  
 SMF ID : \*

**Applications Summary**

System ID	Job Name	Idle Time	Conn Count	Active Conns	Highest Conns	Conn in Backlog
4083	V510DSST	0.02	29	16	17	0
5096	V510N3	329.38	16	3	3	0
4083	V510N3	0.09	16	3	3	0
4084	V510N3	329.40	16	3	3	0
0238	N3510PCM	0.07	16	3	4	0

**Percent Out of Order Segments OR Total 0**

System ID	Job Name	% Segs Out of Order	Tot Segs Out of Order	Tot S Recei
4083	V510DSST	0	616	788.4K
4083	TN3270	0	49	389.3K

**Connections in Backlog OR Total Backlog Connections Rejected**

System ID	Job Name	Conn in Backlog	Tot Backlog Rejected	Backlog Rejected	Backlog Rejected Time Stamp
1062	FTPD1	0	1.5K	0	12/10/05 22:26:01

**Percent Segments Retransmit OR Total Segments Retransmit**

System ID	Job Name	% Segs Retrans	Tot Segs Retrans	Segs Retrans	Retrans	Conn
-----------	----------	----------------	------------------	--------------	---------	------

Tuesday October 09 2012 MORE

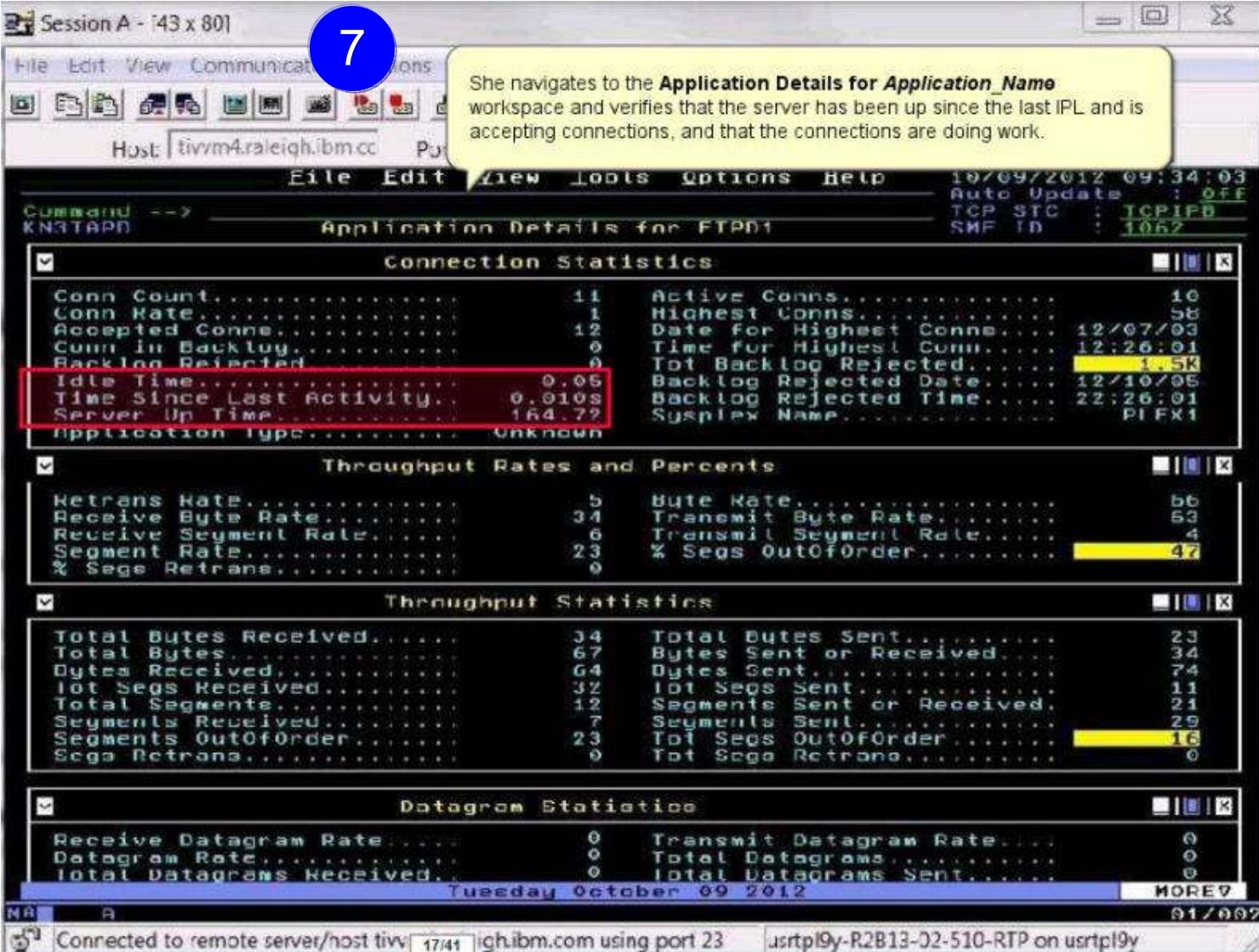
6

She locates the FTP application in the Connections in Backlog OR Total Backlog Connections Rejected subpanel.

# Scheduled logons and “silent” failures ...

7

She navigates to the **Application Details for Application\_Name** workspace and verifies that the server has been up since the last IPL and is accepting connections, and that the connections are doing work.



```

Session A - [43 x 80]
File Edit View Communicat...
Host: tivvm4.raleigh.ibm.cc
Command -->
KN3TAPD
Application Details for FTPD1
10/09/2012 09:34:03
Auto Update : OFF
TCP STC : TCPIFB
SMF ID : 1067

Connection Statistics
Conn Count..... 11
Conn Rate..... 1
Accepted Conns..... 12
Conn in Backlog..... 0
Backlog Rejected..... 0
Idle Time..... 0.05
Time Since Last Activity..... 0.010s
Server Up Time..... 164.72
Application Type..... Unknown
Active Conns..... 10
Highest Conns..... 58
Date for Highest Conns..... 12/07/03
Time for Highest Conn..... 12:26:01
Tot Backlog Rejected..... 1.53
Backlog Rejected Date..... 12/10/05
Backlog Rejected Time..... 22:26:01
Suspex Name..... PIFX1

Throughput Rates and Percents
Retrans Rate..... 5
Receive Byte Rate..... 34
Receive Segment Rate..... 6
Segment Rate..... 23
% Segs Retrans..... 0
Byte Rate..... 56
Transmit Byte Rate..... 53
Transmit Segment Rate..... 4
% Segs OutOfOrder..... 47

Throughput Statistics
Total Bytes Received..... 34
Total Bytes..... 67
Bytes Received..... 64
Tot Segs Received..... 32
Total Segments..... 12
Segments Received..... 7
Segments OutOfOrder..... 23
Segs Retrans..... 0
Total Bytes Sent..... 23
Bytes Sent or Received..... 34
Bytes Sent..... 74
Tot Segs Sent..... 11
Segments Sent or Received..... 21
Segments Sent..... 29
Tot Segs OutOfOrder..... 16
Tot Segs Retrans..... 0

Datagram Statistics
Receive Datagram Rate..... 0
Datagram Rate..... 0
Total Datagrams Received..... 0
Transmit Datagram Rate..... 0
Total Datagrams..... 0
Total Datagrams Sent..... 0

Tuesday October 09 2012
MORE 7
NA A 01/002
Connected to remote server/nost tivv 17/41 |gh.ibm.com using port 23 |usrtp19y-R2B13-02-510-RTP on usrtp19y
  
```

# Scheduled logons and “silent” failures ...

File Edit View Tools Options Help 10/10/2012 10:02:22  
 Command --> Application TCP Listeners and Connections  
 KN31CLS TCP STC : TCP/IPB  
 SMP ID : 1062

**Connections Summary for FTPD1**

Columns 14 to 16 of 22 Rows 1 to 10 of 10

Remote IP Address	Local Port	ΔTransmit ΔByte Rate	ΔReceive ΔByte Rate	Segments OutOfOrder
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0
9.42.45.61	21	54	18	0

**TCP Listeners Summary for FTPD1**

Columns 3 to 6 of 23 Rows 1 to 1 of 1

ΔLocal ΔIP Address	ΔLocal ΔPort	ΔConn in ΔBacklog	ΔDecklog ΔRejected	ΔTot Decklog ΔRejected	ΔIdle ΔTime
::	21	0	0	1.5K	

8

She then navigates to the [Application TCP Listeners and Connections](#) workspace to view the current connections to the FTP server. All values are normal now.

## Scheduled logons and “silent” failures ...

That evening starting at 10 pm, the FTP server was accepting connections as usual, but the backlog limit is quickly exceeded and subsequent connections are rejected.



- 9 The OMEGAMON operator again verifies that the FTP application is accepting connections, and the connections in backlog returns to zero by 10:30 pm. She calls the network expert to update her on the problem.
- 10 When she investigates further, the network expert finds that 10,000+ workstations all “wake up” at the same time and attempt to FTP files at 10pm every night.
- 12 She works with desktop support to roll out a change to the automated nightly timer, staggering the FTP connection requests over a couple of hours.

## Scenario:

# Spotting trends in abnormal connection count

### The setting:

In this use case, a network systems programmer needs to identify the reasons behind slow, steady growth in the number of connections in one IMS region.

The network systems programmer navigates to the **Enterprise Applications Health** (KN3TAPO) workspace to view the IMS applications.

# Spotting trends in an abnormal connection count ...

File Edit View Tools Options Help 10/18/2012 13:55:21  
Auto Update : Off

Command ==> KN3TAP0

**Filter(s)**

- 1. Job Name..... n/a
- 2. Idle Time..... n/a
- 3. Conn Count..... n/a
- 4. Highest Conns..... n/a
- 5. Tot Segs Retrans..... n/a
- 6.
- 7.
- 8.

**Filter Detail**

Column	Job Name
Compare	=
Value	IMS*
UCTRAN	Yes

Columns: SP13, C5B0CP1

1

She brings up the **Filter(s)** menu and selects 1 to specify a **Job Name** filter.

2

She types = as the operator and **IMS\*** as the value. This action will enable the Application Summary subpanel to filter on IMS and show all the IMS regions in the Applications Summary subpanel. She presses **Enter**.

The workspace shows only IMS regions.

Applications Summary

Columns 7 of 21 Rows 1 to 5 of 21

System ID	Job Name	Idle Time	ΔConn Count	Active Conns	ΔHighest Conns	Conn in Backlog
SYS	IMS9CCON	101	6	0	0	0
SP12	IMS9YCON	100	3	0	0	0
SP12	IMSAAO		3	0	0	0
SP12	IMSASO		3	0	1	0
SP13	IMSBYO		3	0	4	0

3

He observes the values of **Connection Count** and **Active Connections High Water Mark**



# Spotting trends in an abnormal connection count ...

4

```
Options Help 10/18/2012 13:56:15
Auto Update : Off
TCP STC : *
SMF ID : *
```

Health

manu

To focus on the IMS regions on System SP13, she types **SP13** into the **SMF ID** field and presses **Enter**.

conn in backlog

5

IMSBYCON has a higher connection count than the other IMS regions.

Applications Summary

Columns 3 to 7 of 24 Rows 1 to 5 of 6

System ID	Job Name	Idle Time	Conn Count	Active Conns	Highest Conns	Conn in Backlog
SP13	IMSCACON	1.85	30	6	24	0
SP13	IMSBYCON	0.50	117	91	91	0
SP13	IMSCWCON	24.73	3	0	0	0
SP13	IMSAGCON	0.03	35	19	2	0
SP13	IMSCZCON	0.00	34	12	2	0

6

He contacts an IMS systems programmer who verifies that all the IMS regions, including **IMSBYCON**, are performing work and no one has reported any connectivity issues.

7

There are no connections in backlog and the Idle Time shows that the IMS region is accepting connections

# Spotting trends in an abnormal connection count ...

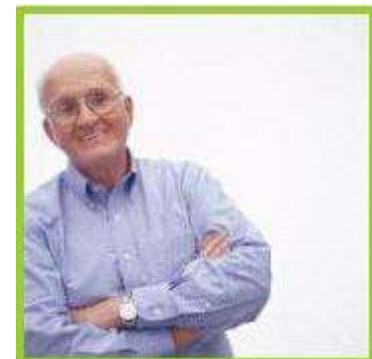
8 He observes the IMS regions over time, watching the **Connection Count** increase while the **Idle Time** and **Connections in Backlog** remain in a normal range.

Friday:	IMSBYCON	0.50	227	140	140	0
Monday:	IMSBYCON	0.50	1228	1000	1000	0

9 He again contacts the IMS systems programmer.

By now, 1000+ connections are open, but not performing any work.

They determine that connections are being opened that are not being closed. The recycle IMS server to relieve the problem and the IMS programmer further investigates the IMS region.



## Scenario: Congested OSA Interface

### The setting:

A systems programmer needs to quickly identify whether one OSA is processing a significantly higher volume of traffic than the other OSA on LPAR SP12. Traffic should be evenly distributed between the two OSA ports.

# Congested OSA interface ...

1

File Edit View Tools Options Help 10/29/2012 16:01:58  
 Command ==> KN3IFS03 Enterprise OSA Interfaces Overview Auto Update : Off  
 TCP STC : \*  
 SMF ID : \*

**OSA Interface Statistics**

System ID	Interface Name	ΔBandwidth Util	Bytes Recv or Xmitd	Δ% Packets in Error	% In Pkts in Error
SP22	TCPIPLINK	0	1.6M	0	0
		0	1.2M	0	0
		0	783.9K	0	0
		0	70.8K	0	0
		0	382.3K	0	0
_SYS	TCPIPLINK	0	23.2M	0	0

He views the OSA Interface Status subpanel to ensure that the **Interface Status** is Active.

**OSA Interface Status**

ΔSystem ID	Interface Name	ΔInterface Status	ΔActual MTU	Device or Datapath	+Duplicate Addr Coun
SP22	TCPIPLINK	Active	8992	Active	0
SP12	TCPIPLINK	Active	8992	Active	0
SP13	TCPIPLINK	Active	8992	Active	0
SYSL	TCPIPLINK	Active	8992	Active	0
SP12	TCPIPLINK	Active	8992	Active	0
_SYS	TCPIPLINK	Active	8992	Active	0

**OSA Interface Write Queue Statistics**

ΔSystem ID	Interface Name	ΔQueue Priority	ΔMax Staging Queue Depth	ΔUsed VSBALs	ΔMax Active VSBALs
SP22	TCPIPLINK2	4	0	6	1
SP22	TCPIPLINK2	3	0	0	0

Monday October 29 2012 MORE

# Congested OSA interface ...

2

He reviews the values in the OSA Interface Statistics subpanel for the **Bytes Recvd** or **Xmitd** and determines that one OSA is transmitting and receiving significantly more traffic than the other OSA.



System ID	Interface Name	ΔBandwidth Util	Bytes Recv or Xmitd	Δ% Packets in Error	% In Pkts in Error
— SP22	TCPIPLINK	0	1.6M	0	0
— SP13	TCPIPLINK	0	1.2M	0	0
— SP12	TCPIPLINK	0	783.9K	0	0
— SP12	TCPIPLINK	0	70.8K	0	0
— SYSL	TCPIPLINK	0	382.3K	0	0
— SYS	TCPIPLINK	0	23.2M	0	0

3

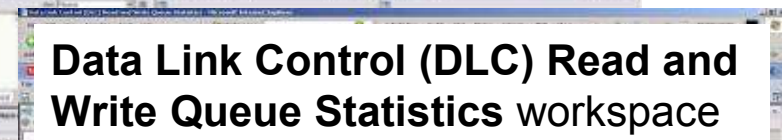
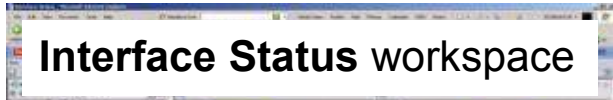
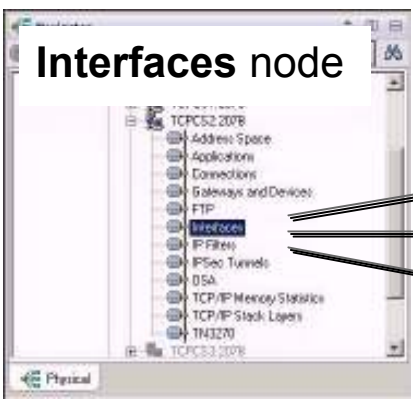
He issues a D TCPIP OMP RTTABLE command to display the main OMPROUTE table and determines that a first hop switch is congested for the non-productive OSA.

He contacts the enterprise networking team to resolve.

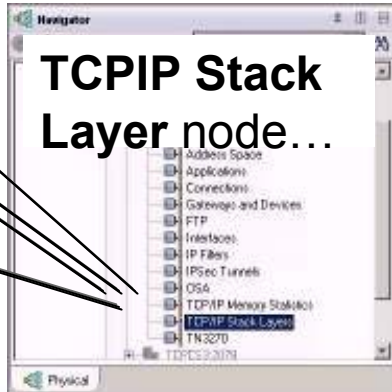
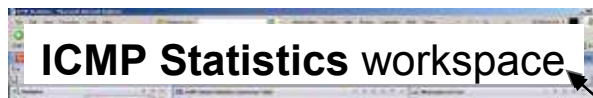
# Improved Diagnostics and decreased CPU utilization

Source changed:

- Old: SNMP
- New: Callable NMI



Additional data collected



# Improved Diagnostics and decreased CPU utilization

## Gateways:

Gateways (Routing table) collected via IOCTL

- Lower CPU
- Reduce SNMP

Additional and improved routing information

Collection Time	Network Address	First Hop	Link or Interface Name	Subnet Mask	Subnet Value	Link or Interface Status	Route Status	Route Type	MTU Value	Dynamic Route	Network Route	IP Version
08/05/10 13:54:56	172.17.0.0	<direct>	LCS4102L	255.255.0.0	172.17.0.0	Ready	Active	ICMP	1500	Yes	Yes	IPv4
08/05/10 13:54:56	127.0.0.1	<direct>	LOOPBACK	HOST	127.0.0.1	Ready	Active	Static	65535	No	No	IPv4
08/05/10 13:54:56	10.62.0.0	<direct>	IUTIQDFEL	255.255.255.0	10.62.0.0	Ready	Active	Static	8192	No	Yes	IPv4
08/05/10 13:54:56	10.93.2.2	<direct>					Active	Static	576	No	No	IPv4
08/05/10 13:54:56	10.11.7.2	<direct>	MPC4172L				Inactive	Static	0	No	No	IPv4
08/05/10 13:54:56	10.12.1.2	<direct>	MPC4212L				Inactive	Static	0	No	No	IPv4
08/05/10 13:54:56	10.11.3.2	<direct>	MPC4132L				Inactive	Static	0	No	No	IPv4
08/05/10 13:54:56	10.11.1.2	<direct>	MPC4112L				Inactive	Static	0	No	No	IPv4
08/05/10 13:54:56	10.11.2.7	<direct>	MPC4172L				Inactive	Replaceable Static	4096	No	No	IPv4

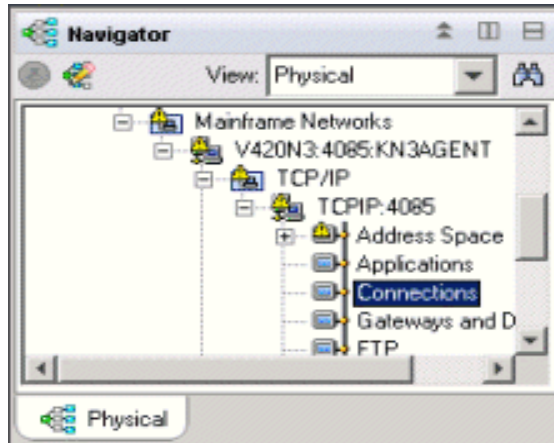
Dynamic Virtual IP Addresses (DVIPAs) reported in Gateways (formerly in Interfaces) table

## OSA-Express:

- Speed diagnosis of OSA and interface problems by following links from OSA to Gateways or Interfaces workspaces
- Each instance of the monitoring agent does not need to collect OSA data for each instance of the monitoring agent in your environment
  - Collect OSA performance statistics from a single LPAR that is sharing the OSA adapter
  - OSA is the only data that is collected via SNMP. You may choose not to configure or run the SNMP daemon on systems where you do not collect OSA data

# Improved Diagnostics and decreased CPU utilization

From **Connections** node...



- Connections
- UDP Endpoints
- TCP Listeners
- TCP Connections
- Application Connections
- Application UDP Endpoints
- Application TCP Listeners
- Application TCP Connections
- TCP Connections Link

Improve overall TCP/IP performance with additional visibility:

- Monitoring the sent and received data queued for TCP connections
- Monitoring Application Transport–Transport Layer Security (AT-TLS)
- Defining the Local Port attribute numerically (sorting)
- Displaying connection state for all connection types
- Enabling the remaining Connections node workspaces for product-specific Take Action commands



# Support for zEnterprise mainframe server improves application availability



OMEGAMON XE for Mainframe Networks provides:

Visibility into the zEnterprise IntraNode Management Network (INMN) and zEnterprise IntraEnsemble Data Network (IEDN)

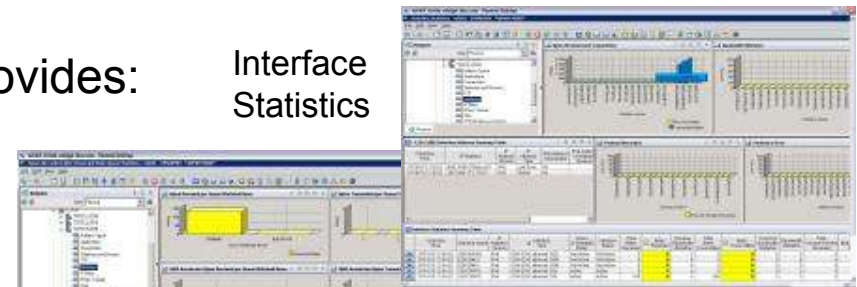
- Isolate and analyze traffic flowing over zEnterprise private networks



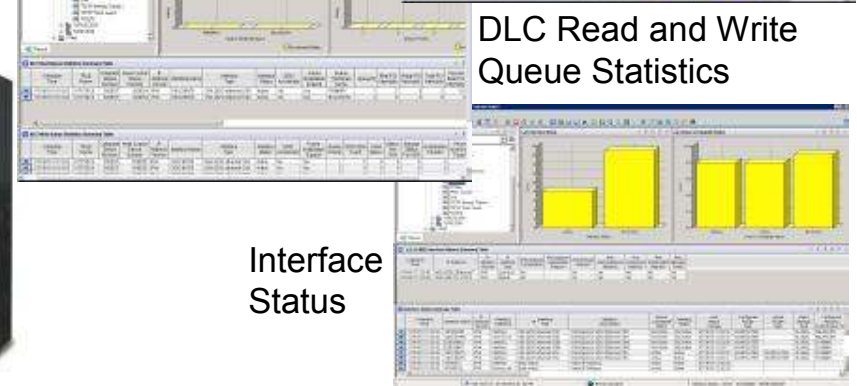
Visibility into z/OS applications and connections using the new zEnterprise Management Network with performance metrics that are useful in debugging problems

- Filter on Outbound Interface Name to show connections using the new INMN and IEDN interfaces

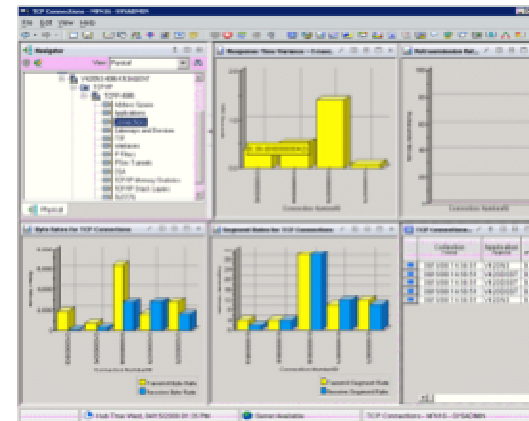
Interface Statistics



DLC Read and Write Queue Statistics



Interface Status



TCP Connections



# Improved resource usage with more control over data collection

```

----- SPECIFY COMPONENT CONFIGURATION (Page 2)-----
Command ==>

Specify the following global information:

OSA Statistics Collection:           ==> Y (Y,N)
Interface Statistics Collection:     ==> Y (Y,N)
Interface Data Link Control Statistics Collection: ==> Y (Y,N)
TCP/IP Stack Layer Statistics Collection: ==> Y (Y,N)
  
```

Configuration Tool

The ability to turn data collection on and off is now available for the following types of data (at system and stack level):

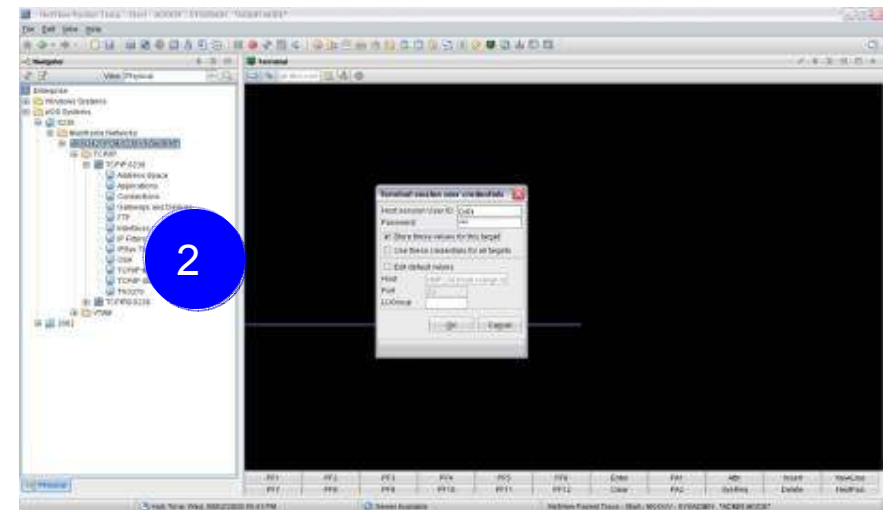
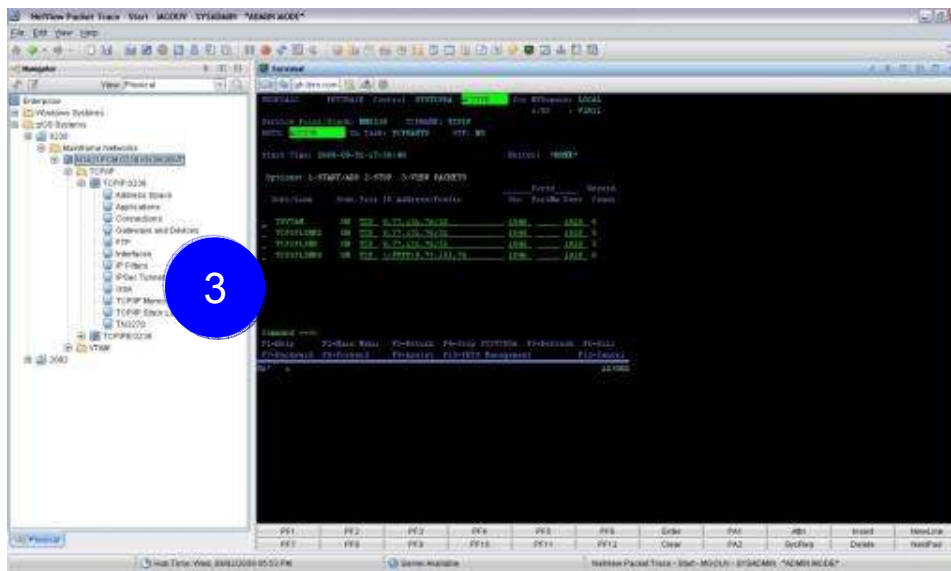
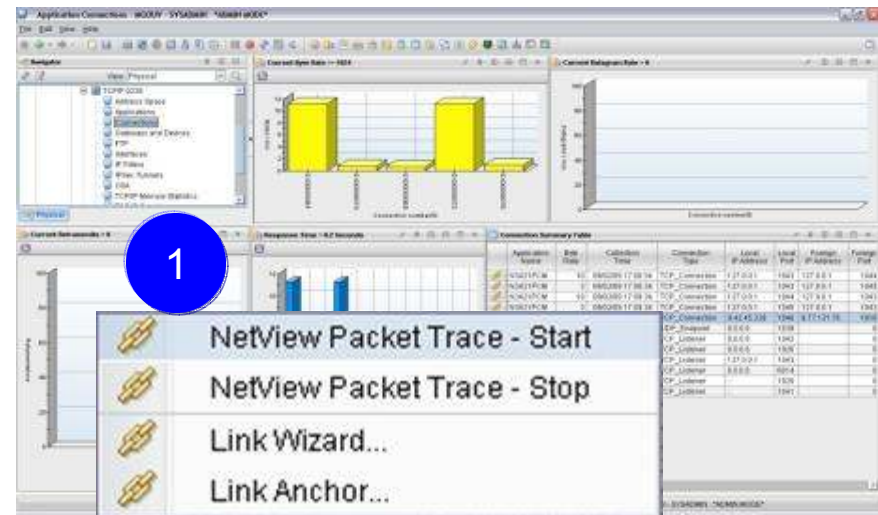
- OSA Statistics
- Interface Statistics
- Data Link Control (DLC) Read and Write Queue Statistics
- Stack Layer Statistics

- Four new attributes for the four new configurable data collection options:

TCP Collector Status										
Connections And Applications Collection	IP Security Collection	OSA Statistics Collection	Stack Layer Statistics Collection	Interface Statistics Collection	Data Link Control Statistics Collection	Routing Table Collection	Routing Table Collection Frequency	TN3270 Server Collection	TN3270 Data Display Interval	F Collection
Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Yes	2	Yes
Yes	No	Yes	Yes	Yes	Yes	Yes	10	Yes	2	Yes
Yes	No	Yes	Yes	Yes	Yes	Yes	10	Yes	2	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes	10	Yes	2	Yes

# Greater synergy with IBM Tivoli NetView for z/OS

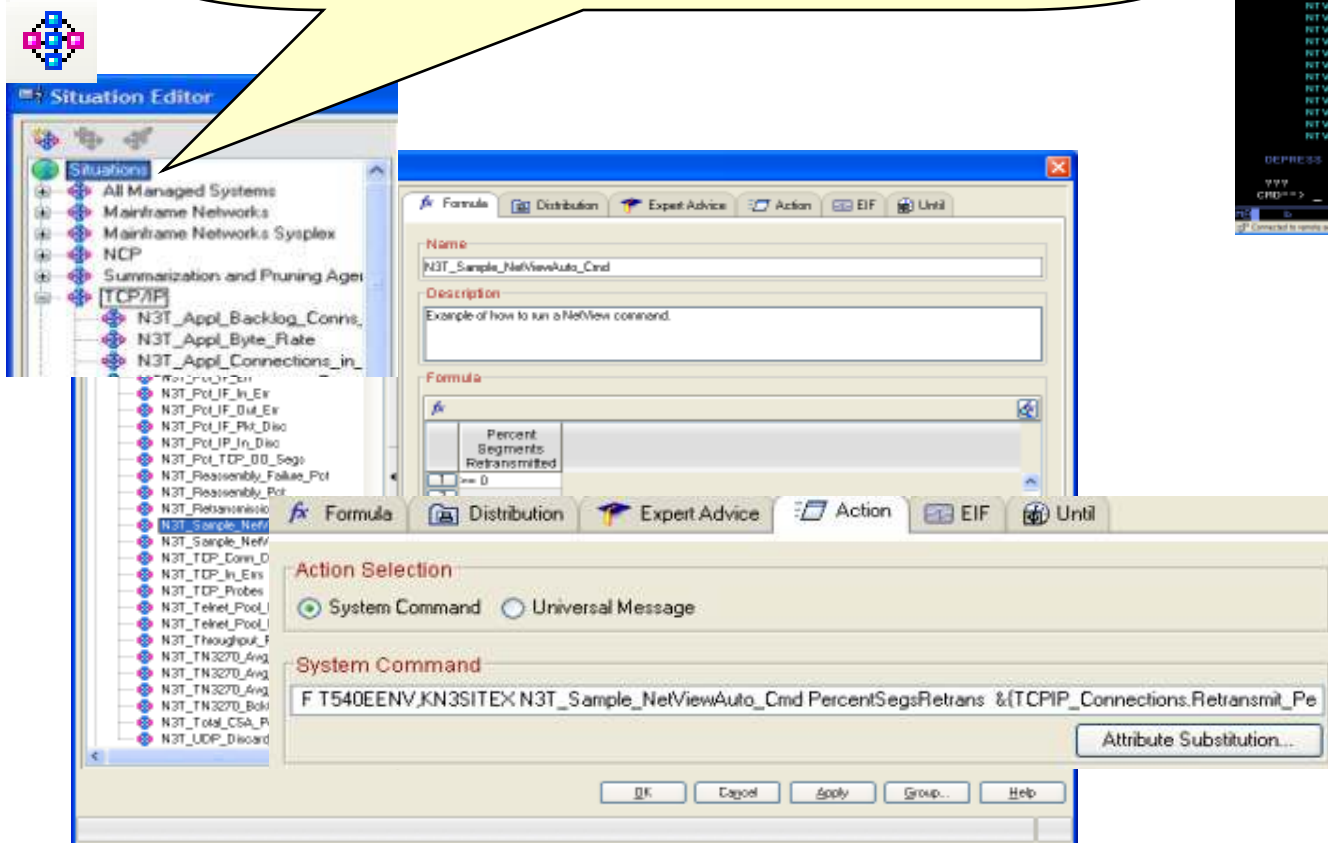
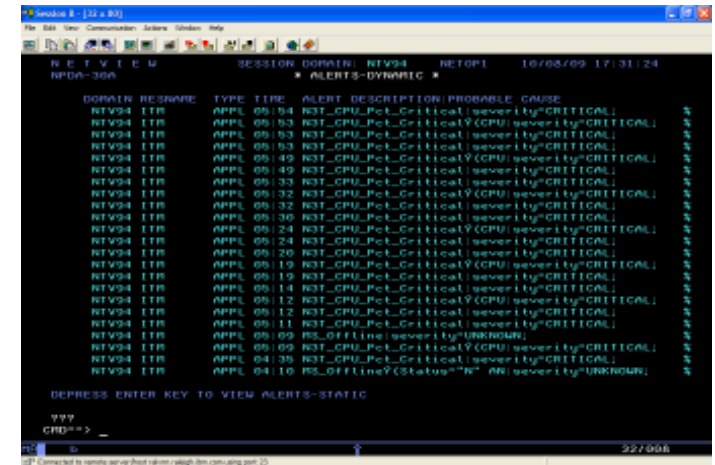
- Launch in context to start or stop a NetView packet trace
  1. Select TCP connection to trace
  2. Logon to NetView
  3. View packet trace definitions after link script completed



# Greater synergy with IBM Tivoli NetView for z/OS

Sample situations trigger NetView for z/OS automation

- Execute command in NetView address space
- Send situation information in message

- Sample NetView for z/OS automation
- Recognize messages
  - Recognize situation events
  - Parse message text
  - Parse Situation event

# Improved management through additional Take Action commands

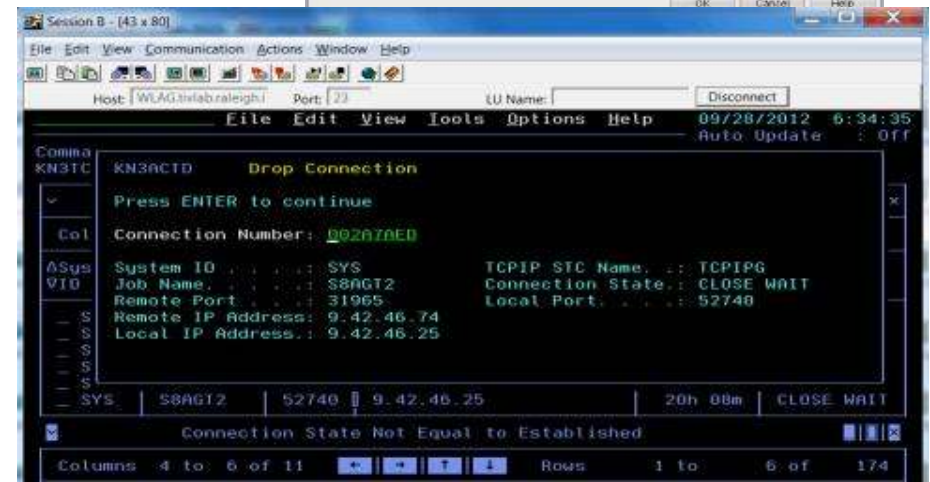
- NSLookup and Tracerte added to Ping and Drop
- Available for Connections, TCP Connections, UDP Endpoints, TCP Listeners, and TN3270 Server Sessions

## TEP Scenario:

- Situation alert created when connection experiences slow response time
- SME navigates to Connections workspace and sees high retransmission rate for a connection
- Is there high congestion in the network?
- Right clicks on the row for connection and choose Tracerte to display Tracerte dialog.
- Issues Tracerte to understand route between the two hosts and if router that is not working

## Enhanced 3270 Scenario:

- Situation alert created when connection experiencing slow response time
- SME navigates to Application TCP Listeners and Connections workspace and identifies connection
- SME types the "/" option to display a list of options
- Types "D" to display the Drop dialog
- Issues Drop and verifies connection dropped



# Improved troubleshooting of data collection problems



Enterprise OMEGAMON for Mainframe Networks Health - NC185130 - SYSADMIN \*ADMIN MODE\*

Enterprise Networks Navigation

Agent and Subnode Status

Name	Status	Version	Reason	Host Address	Managing System
Enterprise Application Health	*ONLINE	05.10.01			N3D0AG22.SP22.KN3AGENT
Enterprise Connections Find	*ONLINE	05.10.01			N3D0AG22.SP22.KN3AGENT
Enterprise Connections Health	*ONLINE	05.10.01			N3D0AG13.SP13.KN3AGENT
Enterprise EE Connections Overview	*ONLINE	05.10.01			N3D0AG13.SP13.KN3AGENT
Enterprise FTP Sessions Find	*ONLINE	05.10.01			N3510PCM.0238.KN3AGENT
Enterprise FTP Sessions Overview	*ONLINE	05.10.01			N3510PCM.0238.KN3AGENT
Enterprise FTP Transfers Find	*ONLINE	05.10.01			HUB_NC185130
Enterprise HPR Connections Overview	*ONLINE	05.10.01	ip.pipe#9.42.46.75[26497]+NM>SP13</NM>		HUB_NC185130
Enterprise HiperSockets Interfaces Overview	*ONLINE	05.10.01	ip.pipe#9.42.46.17[26497]+NM>SP22</NM>		HUB_NC185130

Agent Status and Configuration

System ID	TCP Collection Started	TCP Collection Interval	SNA Collection Started	SNA Collection Interval	PAGENT Daemon Started	IKE Daemon Started	Agent Start Time	TCP Collection Start Time	SNA Collection Start Time	Agent Procedure Name	Agent User Name	Agent User ID	Agent Group Name	Agent Group ID	TCP SNMP Data
SP13	Yes	1	Yes	5	No	No	03/24/13 13:03:31	03/24/13 13:03:31	03/24/13 13:03:41	N3D0AG13	DCUSER0	0	#DCSTC	0	TDNETT.PAR
SP22	Yes	1	Yes	5	No	No	03/24/13 12:31:43	03/24/13 12:31:43	03/24/13 12:31:53	N3D0AG22	DCUSER0	0	#DCSTC	0	TDNETT.PAR
0238	Yes	1	Yes	1	Yes	Yes	03/25/13 04:47:39	03/25/13 04:47:39	03/25/13 04:47:39	N3510PCM	IBUSER	208	OEDFLTG	999999	USER.SNMP0

SNA Collector Status

System ID	CSM Buffer Reporting Collection	EE And HPR Collection	ALL HPR Collection	Buffer Pool And VTAM Environment Collection	Agent VTAM Application Status	Agent VTAM Major Node Name	Agent VTAM Major Node Status	SNA NMI Enabled	PMI Exit Status	PMI Exit Name	Sysplex Name	
0238	Yes	Yes	Yes	Yes	ACTIV	N3PCN3SP	ACTIV	N3PCN3N	Yes	ACTIVE	KN3AMV00	PLEX1
SP13	Yes	Yes	Yes	Yes	ACTIV	N3A3N3SP	ACTIV	N3A3N3N	Yes	ACTIVE	KN3AMV00	LPAR400J
SP22	Yes	Yes	Yes	Yes	ACTIV	N3A2N3SP	ACTIV	N3A2N3N	Yes	ACTIVE	KN3AMV00	LPAR400J

TCP Collector Status

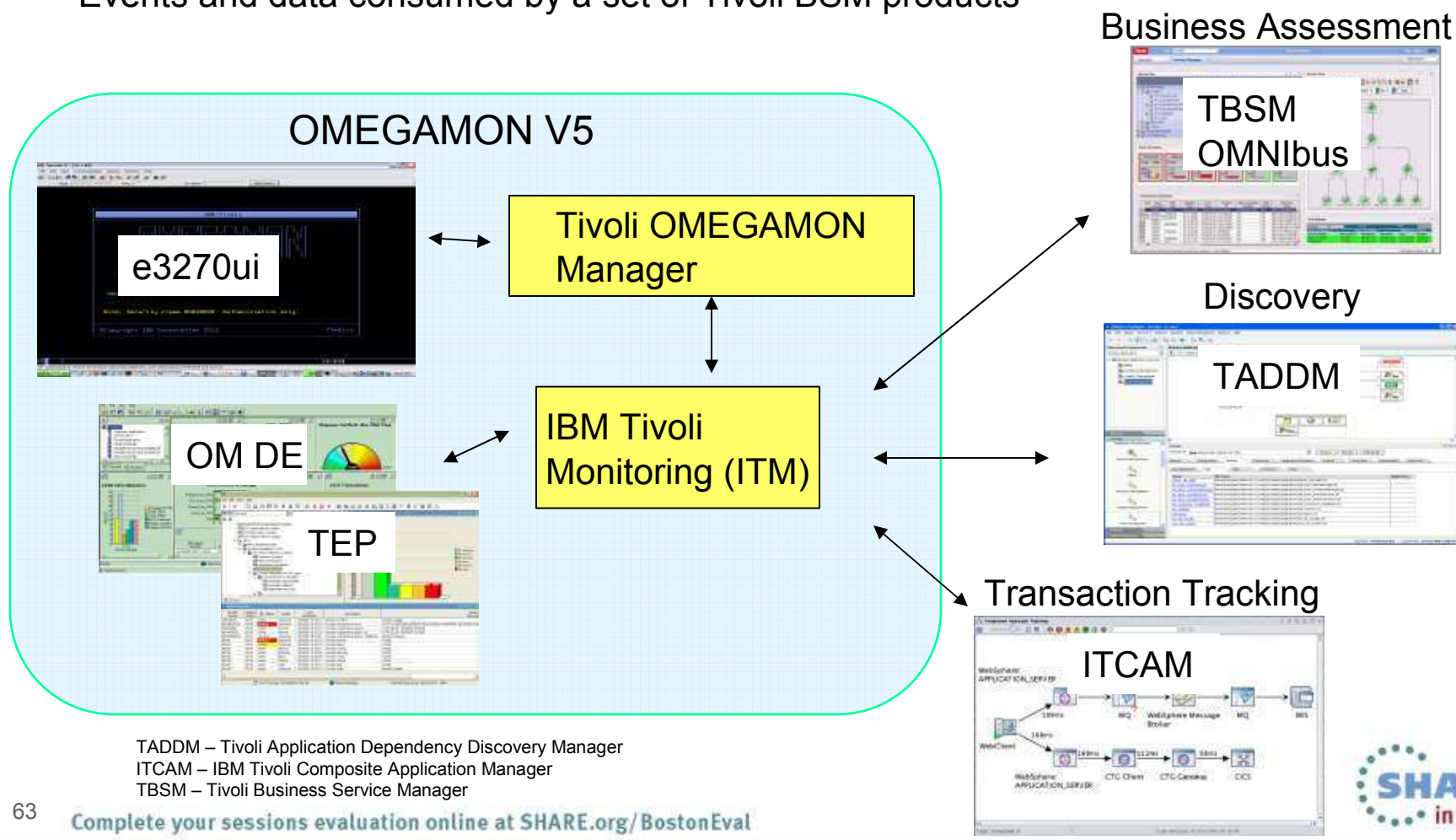
System ID	Monitor	Collection Status	Connections And Applications Collection	Stack Layer Statistics Collection	Interface Statistics Collection	Data Link Control Statistics Collection	OSA Statistics Collection	Routing Table Collection	Routing Table Collection Frequency	TN3270 Server Collection	TN3270 Data Display Interval	FTP Collection	FTP Data Display Interval	IP Security Collection	TCPIP Address Space Status	TCPIP Procedure Name
0238	Yes	OK	Yes	Yes	Yes	Yes	Yes	Yes	5	Yes	24	Yes	24	No	ACTIVE	TCPIP
SP13	Yes	OK	Yes	Yes	Yes	Yes	Yes	Yes	5	Yes	24	Yes	24	Yes	ACTIVE	TCPIP13
SP22	Yes	OK	Yes	Yes	Yes	Yes	Yes	Yes	5	Yes	24	Yes	24	Yes	ACTIVE	TCPIP22

- Agent Status workspace provides configuration and status information about the agent and its data collectors.
- Troubleshoot data collection problems resulting in missing or incomplete data
  - After an install or upgrade
  - After the agent has been running for some time
- New attributes display status of data collection interfaces



# OMEGAMON integrates within a total System z Business Service Management solution

OMEGAMON Portfolio provides performance and availability visibility for System z. Events and data consumed by a set of Tivoli BSM products



# Business success is directly dependent on the health of underlying IT systems, applications, and networks



- Complexity of today's enterprise environments demands solutions that integrate across the enterprise
- IBM in unique position to deliver monitoring and management solutions across enterprise subsystems, including mainframe network
- IBM Tivoli OMEGAMON XE for Mainframe Networks V5.1.1 is key to system and network availability and performance, providing Visibility, Control, and Automation



## Learn about all recent Tivoli announcements and how to exploit them in sessions this week.

### Monday

- 14073 – What's New in OMEGAMON (11:00)
- 14121 – OMEGAMON for Storage (4:30)

### Tuesday

- 13903 – OMEGAMON Lab (9:30)
- 14074 – Automation Control (11:00)
- 14163 – OMEGAMON for Storage (4:30)

### Wednesday

- 13295 – OMEGAMON for Networks (8:00)
- 13771 – Advanced Catalog Mgmt (9:30)
- 14076 – System Automation (11:00)
- 14089 – Storage Management (11:00)
- 14080 – Workload Automation (3:00)

System z Facebook page:

<https://www.facebook.com/IBMsystemz>

Twitter hashtag: #systemzsw



### Thursday

- 13546 – NetView Canslog (12:15)
- 14345 – Lunch and Learn – Mike Baskey
- 14077 – OMEGAMON zAware support (1:30)
- 13545 – NetView Management (3:00)

### Friday

- 14056 - OMEGAMON power user (8:00)
- 13824 - OMEGAMON for DB2 (9:30)
- 14082 – Capacity Management with TDSz

# IBM System z Service Management critical for moving to Mobile, Big Data and Cloud

IBM continues to improve z/OS environment to support new technologies

- OMEGAMON family enhancements
  - OMEGAMON XE on z/OS V5.1.1
  - OMEGAMON XE for Mainframe Networks V5.1.1
  - OMEGAMON XE for Storage V5.2
  - OMEGAMON for z/VM and Linux V4.3
- IBM Automation Control for z/OS
- Workload Scheduler for z/OS v9.1
- Storage Management for z/OS portfolio enhancements



Learn More: <http://www-01.ibm.com/software/os/systemz/itsm/>

Follow us on Service Management Connect:

<http://www.ibm.com/developerworks/servicemanagement/z/index.html>

And, Mainframe Insights:

[https://www-304.ibm.com/connections/blogs/systemz/?lang=en\\_us](https://www-304.ibm.com/connections/blogs/systemz/?lang=en_us)

## Session 13295

# What's New(er) for z/OS Network Performance Monitoring with OMEGAMON



Dean Butler  
(butlerde@us.ibm.com)



YouTube videos of problem solving scenarios:

[http://www.youtube.com/playlist?list=PLiD3\\_RDV00Jcpfl2GCf2mPqprba2KZCsP](http://www.youtube.com/playlist?list=PLiD3_RDV00Jcpfl2GCf2mPqprba2KZCsP)

# Reference

# Product Documentation



- Document library: <https://ibm.biz/Bdxknw>
  - Common books: <https://ibm.biz/BdxknU>
- IBM Tivoli OMEGAMON XE for Mainframe Networks:
  - Planning and Configuration Guide, **SC27-4447**
  - New* Enhanced 3270 User Interface Guide, **SC27-4450**
  - Tivoli Enterprise Portal User's Guide, **SC27-4446**
  - Troubleshooting Guide, **SC27-4448**
  - Parameter Reference, **SC27-4449**
- IBM Tivoli OMEGAMON XE and Tivoli Management Services on z/OS:  
Common Planning and Configuration Guide: **SC23-9734**
- New* IBM Tivoli OMEGAMON XE and Tivoli Management Services: Enhanced  
3270 User Interface Guide: **SC22-5426**

# Technotes



- OMEGAMON XE for Mainframe Network v5.1.1 GA technote:
  - <https://ibm.biz/BdxknT>
- High Availability z/OS Hub TEMS support Technote
  - <http://www-01.ibm.com/support/docview.wss?uid=swg21326770>
- Troubleshooting no data conditions on the OMEGAMON Enhanced 3270 User Interface
  - <http://www-01.ibm.com/support/docview.wss?uid=swg21610269>

# Community, Forum, Wiki



- OMEGAMON XE for Mainframe Networks Community/Forum Support Site:
  - <http://www-01.ibm.com/software/sysmgmt/products/support/R118663G41228S30-community.html>
- Tivoli System z Monitoring and Application Management:
  - <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Tivoli%20System%20z%20Monitoring%20and%20Application%20Management/page/OMEGAMON%20XE%20for%20Mainframe%20Networks>
- OMEGAMON XE for Mainframe Networks Wiki:
  - <https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/Tivoli%20System%20z%20Monitoring%20and%20Application%20Management/page/OMEGAMON%20XE%20for%20Mainframe%20Networks>
- Service Management Connect:
  - <https://www.ibm.com/developerworks/servicemanagement/>